

## **OPERATOR MANUAL**

**Basil 4600 Cage and Rack Washer**

**Basil 4602 Cage and Rack Washer**

**(2008-06-12)**

**P122997-341**

# A WORD FROM STERIS CORPORATION

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This manual contains important information on proper use and maintenance of this equipment. Refer to *SECTION 6, ROUTINE MAINTENANCE*, for instructions in routine care of this washer. **All personnel involved in the use and maintenance of this equipment must carefully review and comply with the warnings, cautions and instructions contained in this manual.** These instructions are important to protect the health and safety of personnel operating a **Basil® 4600 Cage and Rack Washer** or a **Basil® 4602 Cage and Rack Washer** and should be retained in a conveniently accessible area for quick reference.

This equipment is specifically designed only for the uses outlined in this manual.

Complete instructions for uncrating and connecting utilities, as well as equipment drawings, have been provided. If they are missing, contact STERIS for replacement copies, providing the serial and model numbers of the unit.

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## Advisory

**IMPORTANT:** *A listing of the Safety Precautions to be observed when operating this washer can be found in SECTION 1. Do not operate the equipment until you have become familiar with this information.*

Any alteration of this equipment not authorized or performed by STERIS could void the warranty, adversely affect its efficacy and violate national, state and local regulations.

To help assure operators are adequately trained in the safe use of the equipment, STERIS recommends that:

- all personnel who operate or maintain the equipment are trained in its operation and in its safe use;
- personnel working with toxic chemicals and vapors (if applicable) have comprehensive instructions in the unit, washing process, relevant health hazards and methods to detect the escape of toxic materials;
- there is regular training of all personnel concerned with the operation and maintenance of the equipment; attendance records are maintained; and the evidence of understanding is demonstrated.

## Indications For Use

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The Basil 4600 Cage and Rack Washer and Basil 4602 Cage and Rack Washer are heavy duty, large capacity hydrospray washers designed for thorough, efficient cleaning of cages, racks, debris pans and miscellaneous items used in the care of laboratory animals.

These units are specifically designed to only process goods as outlined in this manual. If there is any doubt about a specific material or product, contact the manufacturer of the product for the recommended washing technique.

## Service Information

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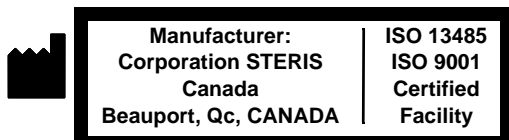
A thorough preventive maintenance program is essential to safe and proper unit operation. This manual contains maintenance schedules and procedures which should be followed for satisfactory equipment performance.

Customers are encouraged to contact STERIS concerning extended service maintenance agreements to give their equipment planned maintenance assuring equipment performance according to factory specifications.

A global network of skilled service specialists can provide periodic inspections and adjustments to help ensure low-cost peak performance. STERIS representatives can provide information regarding annual maintenance agreements. STERIS carries a complete line of accessories for use with this washer. Please contact STERIS for details.

**Basil 4600 Cage and Rack Washer** and **Basil 4602 Cage and Rack Washer** meet the application requirements of the following standard:

- 61010-1 Electrical Equipment for measurement; control and laboratory use; Part 1 General requirements as certified by Underwriters Laboratories (UL).



The base language of this document is ENGLISH. Any translations must be made from the base language document.

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# SAFETY PRECAUTIONS

1

The following *Safety Precautions* **must** be observed when operating or servicing this equipment. WARNING indicates the potential for personal injury and CAUTION indicates the potential for damage to equipment. For emphasis, certain *Safety Precautions* are repeated throughout the manual. **It is important to review ALL Safety Precautions before operating or servicing the unit.**





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## WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

-  Always wear appropriate Personal Protective Equipment (PPE) when cleaning or removing debris from bottom of wash chamber and over suction plate.
-  Only STERIS or STERIS-trained service personnel should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding Service options.
-  Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described within this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.
-  To open doors from inside wash chamber, pull EMERGENCY STOP cables. Washer operation will automatically stop. Then, push firmly on door panel using shoulder and upper arm, applying upper body force.


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## WARNING – PERSONAL INJURY HAZARD:

-  Items in washing cart may move during processing and be filled with residual hot water or protrude from cart at the end of the cycle. Always wear appropriate personal protective equipment (PPE) and carefully remove items from cart.
-  Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed, contaminated debris or water may remain in the bottom of the wash chamber.
-  Keep fingers away from door hinges to prevent pinching.
-  To prevent tipping, place biggest and heaviest items on the lower levels of accessory cart.

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## WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:

-  Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

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## **WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:**



Washer chemicals are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow precautions and instructions on chemical label and in Material Safety Data Sheet (MSDS) prior to handling detergent containers, or servicing detergent injection pumps, tank, and lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling chemicals or servicing chemical injection pumps, tank, and lines.



Wear appropriate Personal Protective Equipment (PPE) when removing clamps and replacing squeeze tubes. Residual chemicals might remain in used squeeze tubes. If chemical contacts skin or eyes, immediately flush with running water for at least 10 minutes. If contact was with eyes, seek medical attention.



Wear gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If spilled or splashed, flush with plenty of water for 15 minutes. If swallowed, DO NOT induce vomiting. Administer an alkali with plenty of water. Seek medical attention immediately.

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## **WARNING – BURN HAZARD:**



Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.



Inner surfaces of washer are very hot after cycle completion. Operator should wear appropriate Personal Protective Equipment (PPE) and avoid all contact with inner walls when entering chamber to unload washer.



Pipes may be extremely hot.



When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.

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## **WARNING – SLIPPING HAZARD:**



To avoid slippery floor conditions, keep floor dry. Promptly wipe up any spilled liquids or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

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## **CAUTION – POSSIBLE EQUIPMENT DAMAGE:**



Always use non-foaming chemical for effective cleaning and proper pump and water level control operation. Follow manufacturer's recommendations for amount of chemical to be used.



Always use a silicone lubricant to lubricate squeeze tubes. Petroleum-based lubricants, such as Vaseline<sup>†</sup> or grease, will cause squeeze tubes to melt.



Avoid product damage. Always select a cycle appropriate for items being processed.

<sup>†</sup> Vaseline is a trademark of Chesebrough-Pond's Incorporated.

## **CAUTION – POSSIBLE EQUIPMENT DAMAGE (Cont'd):**



Before operating unit, always position manifolded Bottle Washing Cart over central water inlet connector. If manifolded accessory is not positioned correctly, damage may result and unit will be unable to effectively wash load.



Do not process load using Bottle Washing Cart when Automatic Floor Tilting option is activated. If Automatic Floor Tilting is used, manifolded water inlet and washer will be damaged.



Remove all cellulose-type bedding from cages and pans before processing. Cellulose bedding can clog filters and piping.








Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion applied with a wire brush or steel wool will scratch and dull stainless steel. Do not use these cleaners on painted surfaces.



When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.

The tables below contain symbols which may be on your Basil 4600 Cage and Rack Washer or 4602 Cage and Rack Washer components:

**Table 1-1. Definition of Symbols on Unit**

Symbol	Definition
	Protective Earth (Ground).
	Warning! Risk of Electrical Shock.
	Attention! Refer to Manual for Further Instructions.
	Fuse Identification.
	Pump Rotation

**Table 1-2. Definition of Symbols on Identification Nameplate**

Symbol	Definition
<b>MODEL</b>	Model Number of the Unit.
<b>S/N</b>	Serial Number of the Unit.
<b>V 3~</b>	Volt, Number of the Phase (Three) Alternating Current.
<b>WIRE</b>	Number of Wires of the Unit, Ground not Included.
<b>YEAR</b>	Year of Manufacture of the Unit.
<b>kW</b>	Power Rating of the Unit
<b>A</b>	Amperage.
<b>Hz</b>	Hertz – Frequency of the Unit.



**IMPORTANT:** A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1. Do not install equipment until you have become familiar with this information.

## 2.1 General

An equipment drawing, showing all utility and space requirements, was supplied with the washer. Clearance space specified on equipment drawing is necessary for ease of installation and to assure proper operation and maintenance of equipment. If documents are missing or misplaced, contact STERIS giving unit serial, equipment, and model numbers. Replacement copies will be sent to you promptly.

### 2.1.1 Technical specifications

These specifications are intended to describe technical information given on nameplate of your washer and to state other relevant information. Check equipment drawing or identification nameplate, located inside control door, above main electrical box, for proper voltage and amperage.

### 2.1.2 Amperage and Power Consumption

**Basil® 4600 Cage and Rack Washer** and **Basil® 4602 Cage and Rack Washer** operate on:

- 208 V~, three-phase, 60 Hz
- 480 V~, three-phase, 60 Hz.

A protective ground conductor is required (Class 1 Equipment). Installation Category is Overvoltage II.

Refer to *equipment drawing* (920-505-383 for Basil 4600; 920-505-871 for Basil 4602 or custom equipment drawing) for proper connection.

**IMPORTANT:** Customer is responsible for compliance with applicable codes and regulations.

**Maximum currents and power consumptions, are indicated on nameplate.**

### 2.1.3 Permissible Environmental Conditions

This unit is designed to give optimal results under the following conditions:

- Indoor use only;
- Altitude of operation up to 6562 ft (2000 m);
- Temperature 41°F to 104°F (5°C to 40°C);
- Maximum relative humidity is 80% for temperatures up to 88°F (31°C) decreasing linearly to 50% relative humidity at 104°F (40°C);
- Installation Category II;
- Pollution Degree 2.

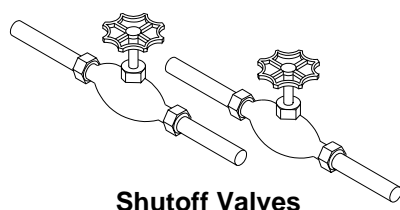
### 2.1.4 Noise Level

Equivalent Sound Pressure Level: **84 dB (A)**. Results determined according to *ISO-3746: 1995 Standard: Acoustics Determination of Sound Power Levels of Noise Sources Survey Method*.

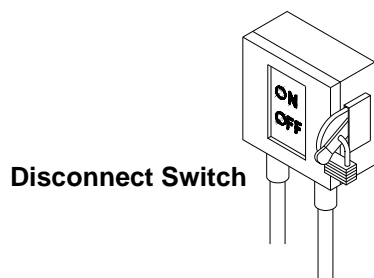
### 2.1.5 Seismic Anchorage System

Washer can be built to seismic zone 3 and 4 requirements.

## 2.2 Installation Checklist



Shutoff Valves



Disconnect Switch

**Figure 2-1. Shutoff Valves and Disconnect Switch**

After installing washer according to *Uncrating/Installation Instructions (P910000-015)*, complete the following checklist to assure complete and correct installation. Contact STERIS to schedule a technician to test your installation and demonstrate proper equipment operation.

- ☐ Shutoff valves (not provided by STERIS) should be installed on steam and water supply lines to unit (see Figure 2-1). Shutoff valves must be capable of being locked in OFF position only and in compliance with occupational health and safety regulations, as well as electric and plumbing codes for any special requirements that may pertain to installation of this unit.
- ☐ Disconnect switches (not provided by STERIS) should be installed in electric supply lines near unit (see Figure 2-1). Disconnect switches must be capable of being locked in OFF position only. Disconnect switches must be installed in electric supply line near unit (within 10' [3 m] of equipment) and in compliance with occupational health and safety regulations, as well as electric and plumbing codes for any special requirements that may pertain to installation of this unit.

**NOTE:** If washer is installed next to other equipment, shutoff valves and disconnect switch should be placed so that service can be shut off to any one unit.

- ☐ Washer is positioned, as shown on equipment drawing, with required service clearance space and in relation to building supply lines.
- ☐ **Basil 4600 Cage and Rack Washer** and **Basil 4602 Cage and Rack Washer** must be installed between two walls, with a key-locked service door, so washer service side is not accessible to operator.
- ☐ Building steam line provides maximum dynamic steam pressure and flow rate to washer as specified on equipment drawing.
- ☐ Drip leg with steam trap installed in steam supply line.
- ☐ Building hot water line supplies water to washer at pressure and temperature specified on equipment drawing.
- ☐ Building cold water line supplies water to washer at pressure specified on equipment drawing.
- ☐ Electrical supply for washer is as specified on equipment drawing.
- ☐ Condensate returns are sized as specified on equipment drawing.
- ☐ Vent connections are sized as specified on equipment drawing.
- ☐ Recirculation pump pressure is within 25 to 60 psig.
- ☐ Recirculation pump motor rotating in direction shown by arrow.
- ☐ Self-cleaning screen assembly functioning properly.
- ☐ Carriage drive motor rotating in direction shown by arrow.
- ☐ Carriage drive system functioning properly.
- ☐ Carriage drive motor amperage within rating indicated on the motor.
- ☐ Optional exhaust fan rotating in direction shown by arrow.
- ☐ All piping is leak-free.
- ☐ Chamber sump steam coil functioning properly.
- ☐ Door safety switch(es) functioning properly.
- ☐ Cabinet joints are completely sealed, no leaks (for verification, run machine for 1/2 hour).
- ☐ Door(s) easily opens from inside of chamber.
- ☐ Safety cables immediately stop washer operation when pulled.
- ☐ Each gear box plastic cap removed and replaced with air vent provided.
- ☐ Floor surrounding unit has non-slip surface.

***IMPORTANT:*** After a few weeks of operation, inspect unit for leaks. Retighten all clamps and connections.

## 2.3 Chemical Additives Specifications

The selection of chemical additives is open for customer preference; however, in order to achieve optimal performance, the selected chemical additives must meet as a minimum, the following specifications:

Product Description	Use Dilution Range oz/gal (mL/L) Dilution	pH Range at Use	Other Applicable Requirements
Alkaline Chemicals	1/4 - 4 (2-32)	9.0 - 12.0	Liquid, non-foaming, and viscosity below 200 SSU (0.0004623 ft <sup>2</sup> /sec).
Acidic Chemicals	1/4 - 4 (2-32)	3.0 - 6.0	Liquid, non-foaming, free rinsing, and viscosity below 200 SSU (0.0004623 ft <sup>2</sup> /sec).
Descalers	1/2 -2	<2.5	Liquid, non-foaming, phosphoric acid-based, and viscosity below 200 SSU (0.0004623 ft <sup>2</sup> /sec).

*NOTE: When choosing and using chemicals, take note of the following:*

- 1) *Follow chemical label recommendations for concentration of chemical to use.*
- 2) *Follow chemical manufacturer's recommendations to determine the temperature of the WASH treatment.*
- 3) *Follow chemical manufacturer's recommendations for the amount of chemical used according to water hardness.*

To achieve maximum cleaning efficiency, select chemical appropriate to soil type being processed. STERIS recommends the following chemicals:

- **Cage-Klenz® 100 Alkaline Cage Wash Detergent** - (Alkaline) formulated to remove urine, scale, animal fats, oils and other organic soils from cage materials.
- **Cage-Klenz® 200 Acid-Based Cage Wash Detergent** - (Acidic) formulated to remove urine, scale, animal fats, oils and other organic soils from cage materials.
- **Liquid Descaler Acid-Based Scale Remover** - for removing scale and other hard water deposits. For use in animal care centers.

*NOTE: Certain products may not be available in your area. Contact your STERIS representative for availability of these products and for ordering information.*

**IMPORTANT:** STERIS does not promote, recommend, nor endorse the use of any other type of chemical additives in the processing of articles in the Basil 4600/4602 Cage and Rack Washers, such as drying agents, strong alkaline detergents (pH>12), alcohol rinses and liquid germicides including hypochloric acid (bleach).

# COMPONENT IDENTIFICATION

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**IMPORTANT:** A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1. Do not install equipment until you have become familiar with this information.

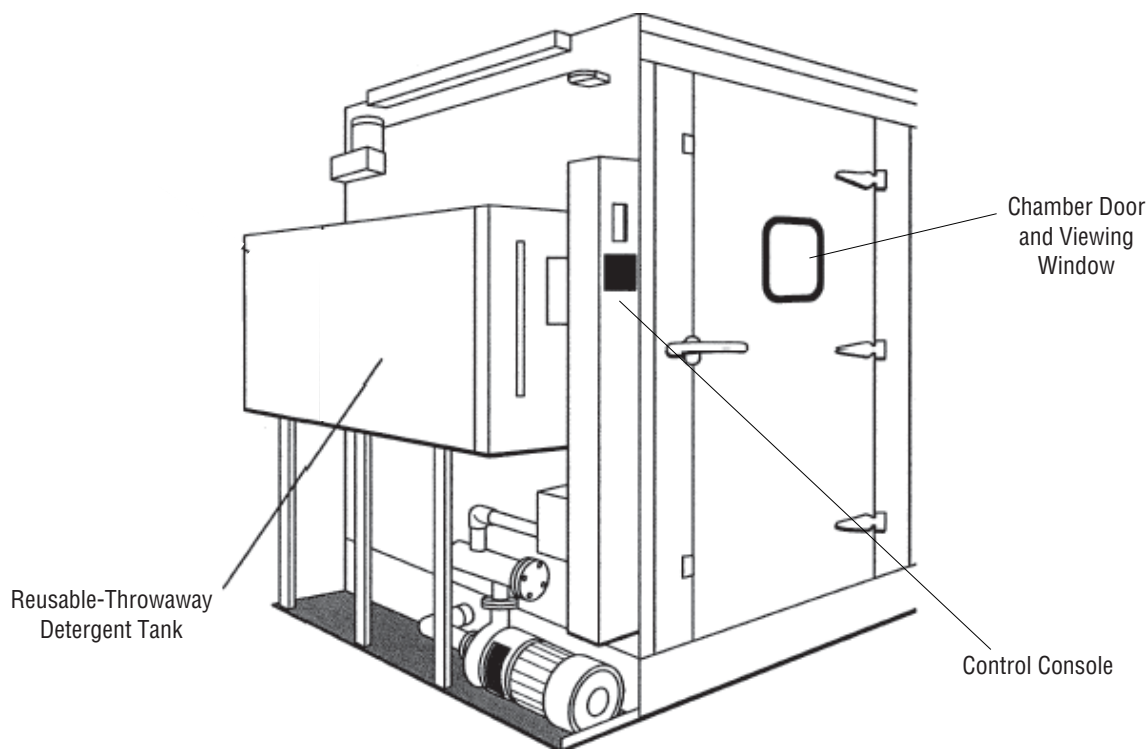
## 3.1 General

Become familiar with location and function of all major components and controls, as well as their function before operating this unit (see Figure 3-1).

Two models are available: **Basil® 4600 Cage and Rack Washer** and **Basil® 4602 Cage and Rack Washer**.

- Basil 4600:  
Wash Chamber: 46" W x 85" H x 92" L (1168 x 2159 x 2336 mm)  
Overall Unit: 82" W x 102" H x 99" L (2082 x 2590 x 2514 mm)  
Equipped with Reusable - Throwaway Detergent Tank
- Basil 4602:  
Wash Chamber: 46" W x 85" H x 188" L (1168 x 2159 x 4775 mm)  
Overall Unit: 82" W x 102" H x 195" L (2082 x 2590 x 4953 mm)  
Equipped with Reusable - Throwaway Detergent Tank

Each model is equipped with a user-programmable microcomputer control system capable of storing up to twelve treatment cycles to process a wide variety of loads. Computer control system monitors and automatically controls all cycle operations.



**Figure 3-1. Washer Components - Basil 4600 (Typical)**

### 3.2 POWER-OFF/ STANDBY Switch

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**POWER-OFF/STANDBY** switch, located behind the printer door, includes two settings which direct operation of control (see Figure 3-2):

- **POWER** – Press top portion of POWER-OFF/STANDBY switch to initialize control and place control in Ready Mode.
- **OFF/STANDBY** – Press bottom portion of POWER-OFF/STANDBY switch to initiate Shutdown Cycle and place control in Standby Mode.

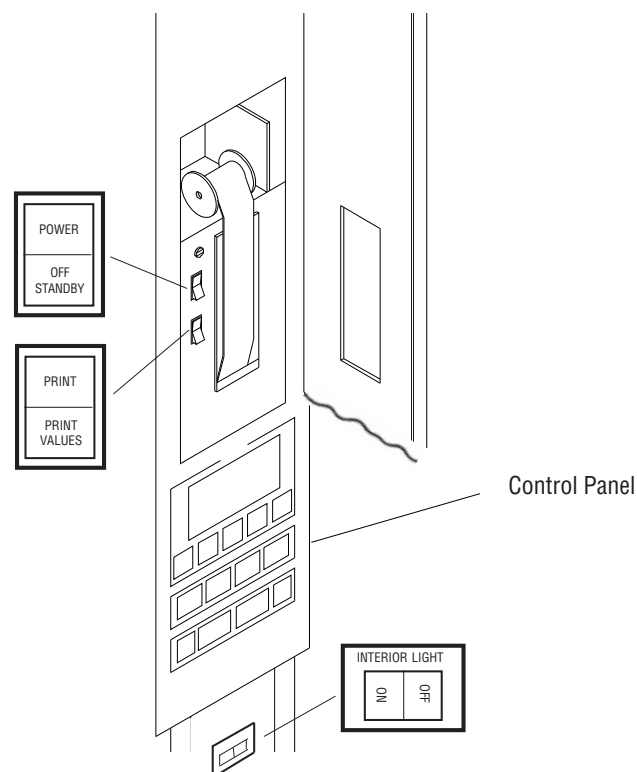
***NOTE:** Control should be placed in Standby Mode for last cycle of the day and when washer is not in use for an extended period of time.*

***IMPORTANT:** POWER-OFF/STANDBY switch does not turn off electrical power to unit.*

### 3.3 Interior Light

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**Interior light**, can be manually controlled by operator through a toggle switch located behind printer door, below control panel, on load side (see Figure 3-2). Interior light illuminates wash chamber when loading or unloading washer, or it can be left ON during a whole washing cycle to view washing process.



**Figure 3-2. Control Column**

## 3.4 Control Panel

Control Panel is used to direct all washer functions (see Figure 3-3). Operator may program specific cycles, review and select cycles, start, stop or reset cycle operation, extend or bypass cycle phases, and monitor cycle performance.

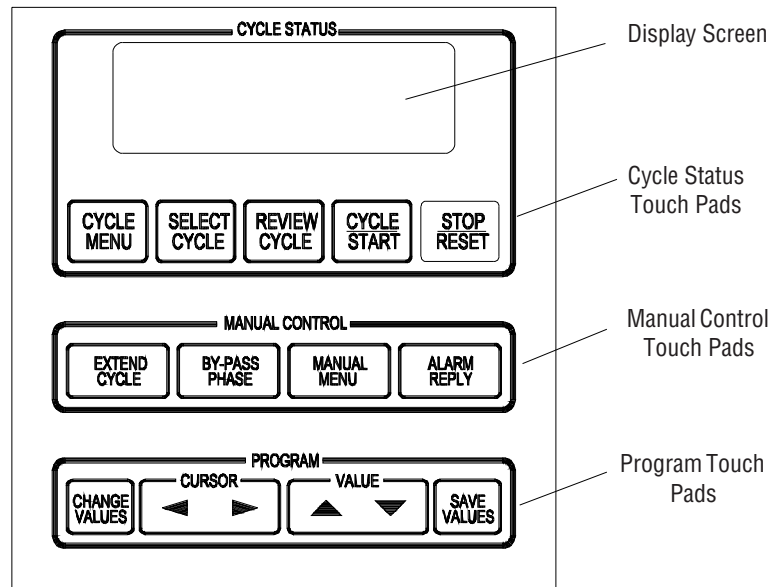


Figure 3-3. Control Panel

### 3.4.1 Display Screen

Two line alpha-numeric screen displays cycle program data on demand, in-cycle performance data and operator instructions. Display screen also indicates certain abnormal conditions that may occur during a cycle.

### 3.4.2 Cycle Status Touch Pads

- **CYCLE MENU touch pad** – press to view first cycle menu. Press again to advance screen to next cycle menu. Three menus are available, each with four cycles.
- **SELECT CYCLE touch pad** – press until desired cycle name flashes.

*NOTE: When a displayed cycle name or phase value is selected, corresponding word or digit flashes.*

- **REVIEW CYCLE touch pad** – press to review cycle phases and values programmed for selected cycle.
- **CYCLE/START touch pad** – press once to display name of selected cycle. Press a second time to start cycle.

*NOTE: Selected cycle name remains on screen for 5 seconds*

after pressing **CYCLE/START** touch pad once. To start a cycle, **CYCLE/START** touch pad must be pressed a second time while selected cycle name is displayed. If touch pad is not pressed within 5 seconds, screen automatically returns to Cycle Menu.

- **STOP/RESET touch pad** – press once to stop cycle operation. Press a second time to abort cycle and return screen to cycle menu.

*NOTE: When cycle is stopped, press Cycle/Start touch pad once to resume cycle operation. Cycle operation resumes at beginning of interrupted phase function (i.e., filling, recirculating, draining). When cycle is aborted, cycle operation is discontinued and cycle must be re-started from the beginning.*

### 3.4.3 Manual Control Touch Pads

- **EXTEND PHASE touch pad** – press to temporarily increase selected phase time. On completion of cycle, phase time returns to programmed setpoint.
- **BYPASS PHASE touch pad** – press to bypass specific phase in progress and advance cycle to next phase.

*NOTE: Bypass Phase touch pad can only be used when a cycle is in progress. During cycle, filling and draining functions can not be bypassed. In addition, a phase can not be bypassed if Temperature Guarantee feature is selected for that phase.*

- **MANUAL MENU touch pad** – press to view washer functions which can be controlled manually.
- **ALARM REPLY touch pad** – press to turn off alarm buzzer and acknowledge displayed alarm message. Refer to *SECTION 7, TROUBLESHOOTING*, for specific alarm conditions and corrective actions.

### 3.4.4 Program Touch Pads

Program touch pads allow programming of twelve distinct cycles and changing of previously programmed cycle values to process different types of loads. Cycle programming may be limited by access code to ensure process integrity. Refer to *SECTION 5, CYCLE PROGRAMMING*, for details on cycle programming and access code feature.

- **CHANGE VALUES touch pad** – press to access Change Values mode. Change Values mode allows authorized operators to change user-programmable items. Refer to *SECTION 5, CYCLE PROGRAMMING*, for details about Change Values Mode.

*NOTE: Examples of user-programmable items include cycle name, phase temperature, phase time, and questions regarding phase options (e.g., retention of final rinse water).*

- **CURSOR (left or right) touch pad** – press until item to be changed (word, letter, or number) flashes.
- **VALUE (up or down) touch pad** – depending on item flashing (selected), press to either toggle between answer selections or scroll through alphabet and numbers 0 through 9.

*NOTE: Alphabet includes characters for an underline ( \_ ) and a space ( ).*

- **SAVE VALUES touch pad** – press to save changes made, exit Change Values mode and return screen to cycle menu.

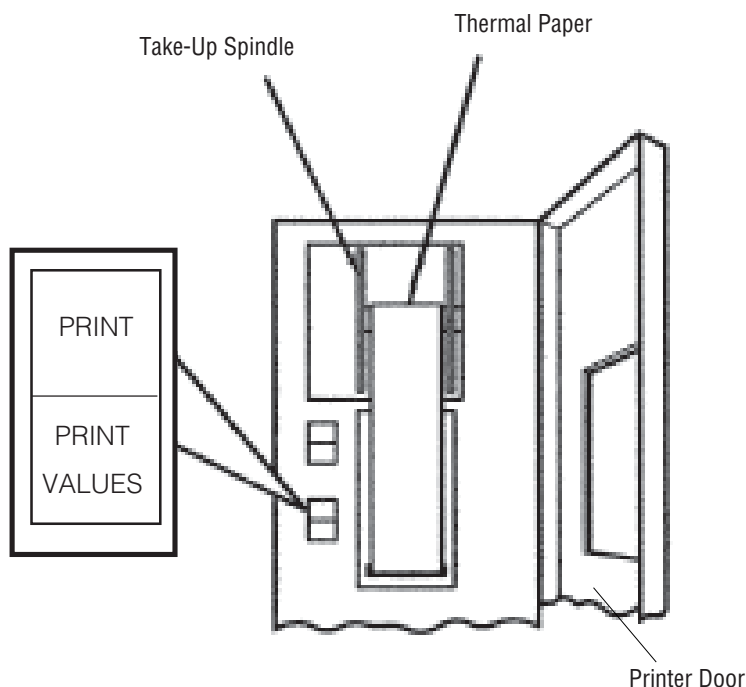
## 3.5 Printer

Printer records pertinent cycle data on 2-1/4" wide thermal paper (see Figure 3-4). Refer to *SECTION 6.7, PRINTER PAPER*, for information on changing paper roll and storing thermal paper.

### 3.5.1 Printer Function Switch

Printer Function Switch controls the following two printer functions:

- **PRINT** – press top of Printer Function Switch to generate a print of alkaline and acid detergent setpoints (if conductivity option) and all RTD temperatures (actual water temperature).
- **PRINT VALUES** – press bottom of Printer Function Switch to generate a complete printout of all cycle parameters.



**Figure 3-4. Printer**

### 3.5.2 Sample Printout

The following is an example of a typical cycle printout (see Figure 3-5):

- **POWER UP**  
When POWER-OFF/STANDBY switch is set to POWER, generated printout lists time and date control was turned on and unit's serial number.
- **CYCLE START**  
When **CYCLE/START** touch pad is pressed twice to begin selected cycle, generated printout lists name of cycle started, time and date cycle was started, cycle number, and unit number.
- **IN-CYCLE PERFORMANCE**  
During a cycle, generated printout lists start and end time of each phase, along with actual temperature of solution/water in chamber sump.
- **END-OF-CYCLE PERFORMANCE SUMMARY**  
At end of a cycle, generated printout lists time cycle was completed, maximum wash and rinse temperatures reached during cycle, and total cycle processing time.
- **ALARM CONDITION**  
When an alarm condition occurs, generated printout lists type of alarm and time it occurred (see Figure 3-6). Once operator presses Alarm Reply touch pad, generated printout lists time alarm was acknowledged.

* CONTROL ON	8:32:31A			
-----				
CYCLE – CYCLE 1			Cycle Start	
-----				
CYCLE START	8:37:33A			
CYCLE DATE	4/24/05			
CYCLE NUMBER	00000001			
UNIT NUMBER	3600000000			
-----				
PHASE	TIME	F	In-Cycle Performance	
-----				
PRE-WASH	8:38:03A	141.5		
	8:39:03A	135.0		
DET-WASH	8:41:33A	146.3		
	8:46:33A	144.2		
RINSE 1	8:49:10A	183.5		
	8:50:40A	182.7		
RINSE 2	8:53:00A	184.0		
	8:54:30A	182.5		
F. RINSE	8:57:20A	184.3		
	8:58:50A	183.8		
EXHAUST	8:59:50A	183.8		
-----				
CYCLE COMPLETE	9:01:20A		End-of Cycle Performance Summary	
MAX WASH TEMP=	146.3F			
MAX RINSE TEMP=	184.3F			
CYCKE TIME=	0:23:27			
-----				
READY TO UNLOAD				
-----				
DOOR OPENED	9:03:42A			

Figure 3-5. Sample Printout

PHASE	TIME	F
-----		
PREWASH	10:15:20A	163.5
	10:17:02A	166.8
* ALARM		10:18:02A
SUMP		
TOO LONG IN FILL		
-----		
ALARM ACKNOWLEDGED		
	AT 10:18:15A	

Figure 3-6. Sample Alarm Printout

\_\_\_\_\_

All washer functions except POWER-OFF/STANDBY and PRINT/PRINT VALUES can be directed from this control panel, and display screen concurrently shows same cycle performance data as load-side control panel.



\_\_\_\_\_

Oscillating jet system travels back and forth along length of chamber during recirculating/spraying phase function. Jet system is equipped with a safety clutch that stops movement of oscillating carriage if an obstruction is detected.



### 3.8 Safety System



**WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:** To open doors from inside wash chamber, pull **EMERGENCY STOP** cables. Washer operation will automatically stop. Then, push firmly on door panel using shoulder and upper arm, applying upper body force.

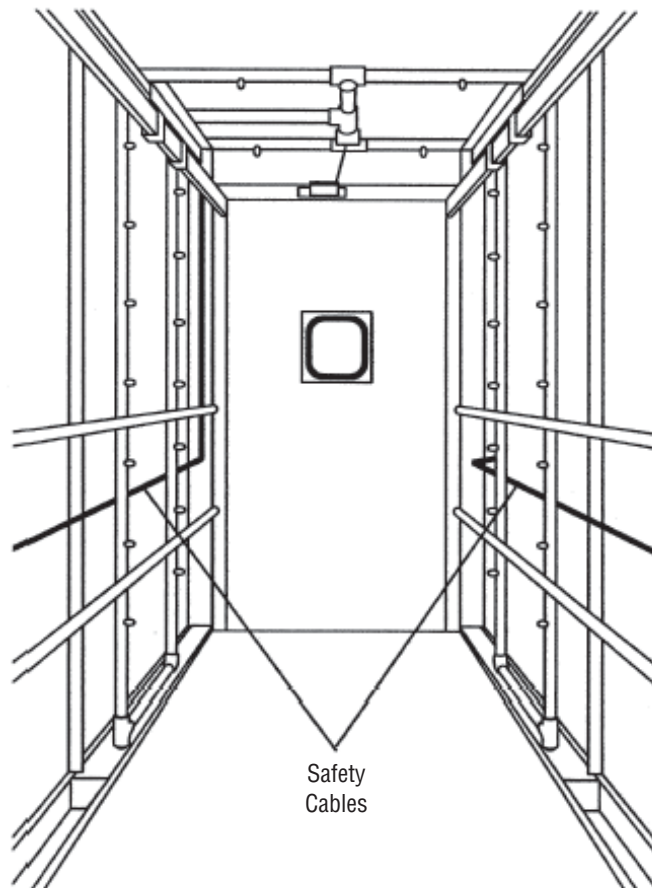
Chamber doors are equipped with a safety switch to stop washer operation if door is opened during a cycle and to prevent start of washer operation if door is not securely closed.

Chamber doors are also equipped with a spring-loaded, explosion relief type safety latch. Door can be easily opened when pushed from inside of wash chamber.

Two stainless-steel, red-coated safety cables are installed inside wash chamber, one along each side (see Figure 3-9). If cable is pulled, washer operation is immediately stopped.

Oscillating jet system is equipped with a mechanical clutch to disengage carriage drive if an obstruction is encountered, preventing damage to spray headers and load items.

Load-side and unload-side control panels are equipped with **STOP/RESET** touch pads. Press touch pad once to stop cycle operation, and twice to abort cycle.



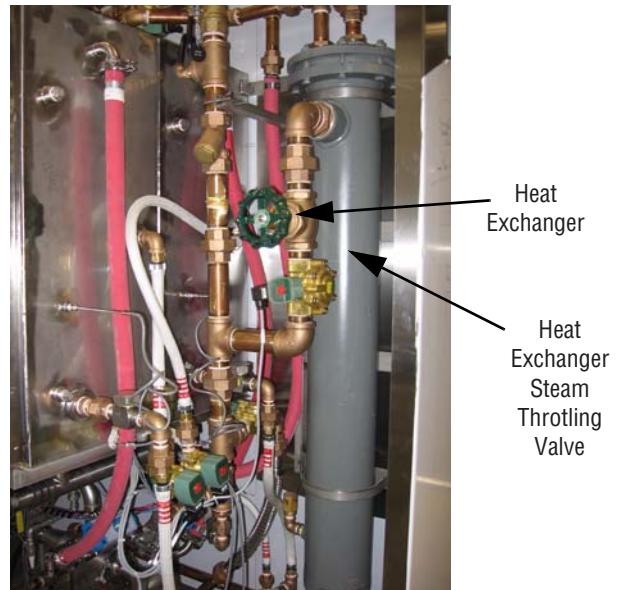
**Figure 3-9. Safety Cables**

### 3.9 Heat Exchanger

---

Washer is equipped with a steam heat exchanger and valving system to preheat incoming fill water, reducing normal water/solution heat-up time (see Figure 3-10).

System is fully automatic and works during filling function of Pre-wash, optional Acid Wash (if acid tank is not available), and Rinse phases. Heat exchanger steam valve is energized only if temperature is below 165°F (73.8°C).



**Figure 3-10. Heat Exchanger**

### 3.10 Automatic Detergent Injection System

---

Automatic Detergent Injection System includes a peristaltic pump mounted to washer exterior. System also includes a conductivity probe located in chamber sump.

If using alkaline detergent with injection system, alkaline detergent is automatically injected into chamber sump during Wash phase of a cycle.

- Hot detergent solution from alkaline detergent tank fills sump until required solution level is attained. Once sump is full, control checks detergent concentration of solution in sump. Alkaline detergent is then injected into sump until solution reaches set concentration level. Alkaline detergent solution is monitored and maintained at set concentration level while recirculating and spraying over load.

If using acid detergent with injection system, acid detergent is automatically injected into chamber sump during Acid Wash phase of a cycle.

- Hot detergent solution from acid detergent tank fills sump until required solution level is attained. Once sump is full, control checks detergent concentration of solution in sump. Acid detergent is then injected into sump until solution reaches set concentration level. Acid detergent solution is monitored and maintained at set concentration level while recirculating and spraying over load.

### **3.11 Reusable- Throwaway Acid Detergent System**

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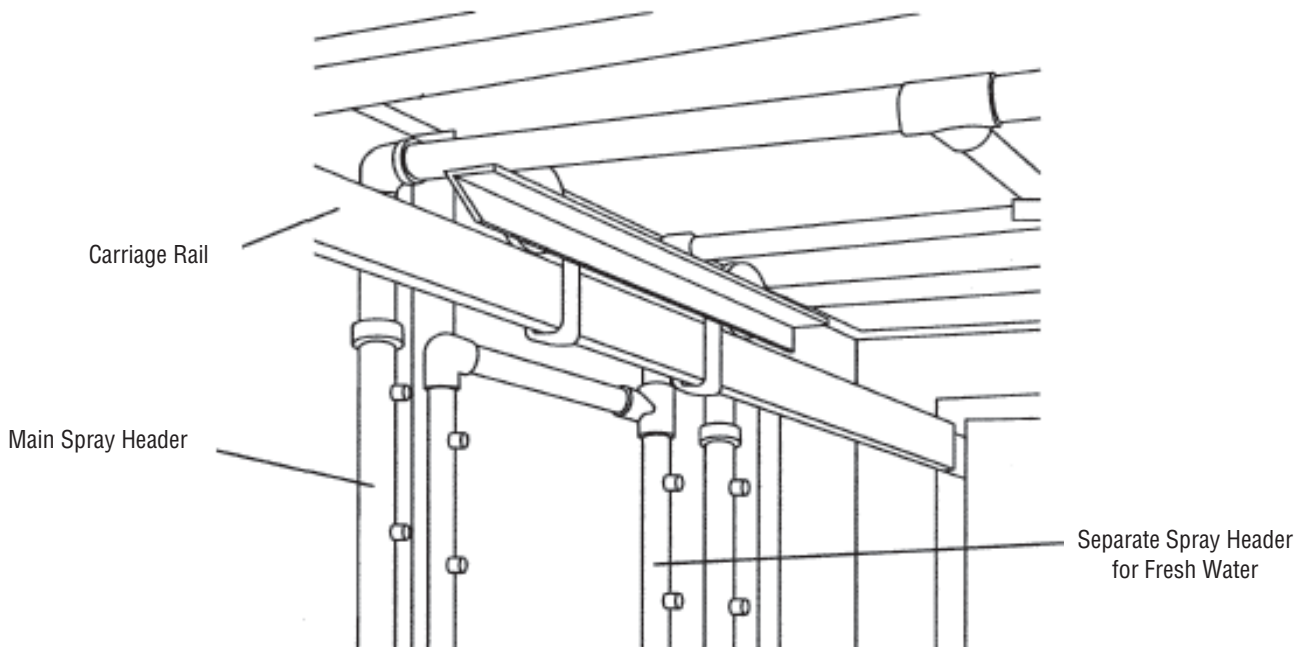
Washers equipped with Reusable-Throwaway Acid Detergent System can be programmed to process an Acid Wash phase after Detergent Wash phase, and to either save or drain acid detergent solution on completion of phase.

System includes a separate acid detergent tank and piping constructed of stainless steel. Acid detergent tank is equipped with a steam coil to maintain acid detergent solution at programmed temperature.

### **3.12 Non- Recirculated Final Rinse**

---

Washers equipped with Non-Recirculated Final Rinse System can be programmed to spray load with fresh, non-recirculated water during standard Final Rinse phase. System includes a separate spray header mounted directly to each side of oscillating carriage, inside of main spray headers (see Figure 3-11).



**Figure 3-11. Non-Recirculated Final Rinse Spray Header**

### **3.13 Feeder Bottle Washing System**

---

Feeder Bottle Washing System provides capability of processing a loaded bottle cart during normal cycle operation. System includes a quick disconnect coupler.

*NOTE: Bottle washing cart is available as a separate accessory.*

Cycle must be programmed to process bottle cart before starting cycle operation.

### **3.14 Automatic Water Flush System for Two Racks**

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Automatic Water Flush System for two racks permits cleaning of facility's automatic watering system during normal cycle operation. System includes a set of two hoses, each equipped with a quick disconnect fitting, mounted on service side carriage rail.

Hoses are manually connected to customer cage watering racks moved into wash chamber. During Final Rinse filling, fresh hot water is sent through heat exchanger and sprayed over cage watering racks for programmed filling time interval.

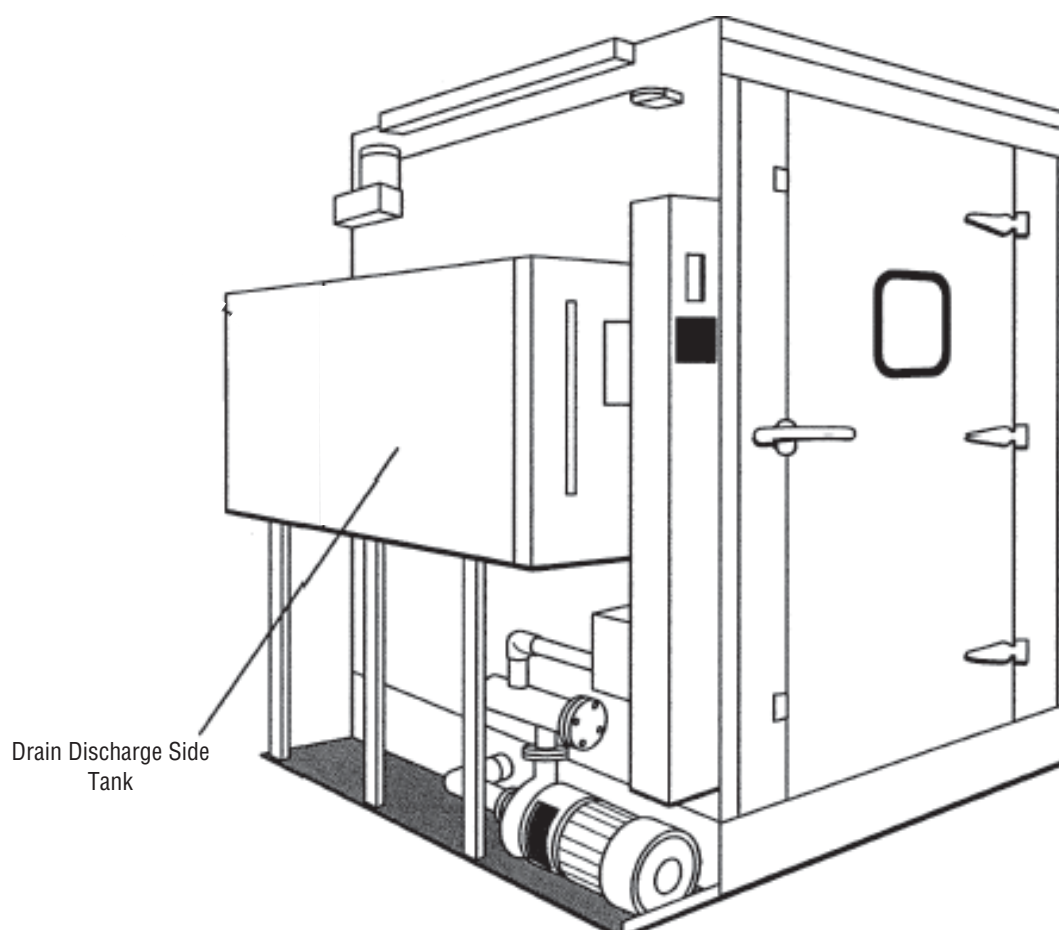
### **3.15 Drain Discharge Cooldown with Side Tank and Temperature Guarantee**

---

A separate tank is typically mounted along service side of washer to temporarily retain and cool all drain discharges (see Figure 3-12).

*NOTE: Location of drain discharge side tank may change depending on other options ordered with washer.*

During draining function of each phase, solution/water in sump is automatically pumped to side tank where cold tap water is added. Cold water remains on until water temperature in side tank reaches programmed set point. Once cooled to set temperature, side tank gravity drains to building drain system.



**Figure 3-12. Drain Discharge Side Tank (Typical)**

### **3.16 Drain Discharge Cooldown System with Cold Water Injection Only**

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Washer drain system is piped to automatically cool all drain discharges using building cold water supply.

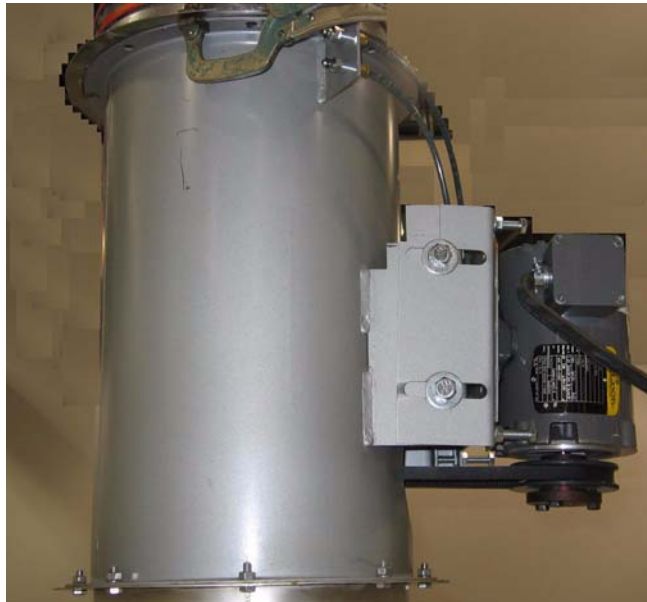
During draining function of each phase, cold tap water is injected into washer drain line as washer drain discharges are sent directly to building drain system. Cold water remains on until sump drain valve closes.

### **3.17 Exhaust Fan**

---

Exhaust Fan is mounted directly in washer exhaust line, on top of unit (see Figure 3-13).

During unit operation, exhaust fan removes residual vapors from wash chamber and directs vapors to building exhaust duct.



**Figure 3-13. Exhaust Fan**



**IMPORTANT:** A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1. Do not install equipment until you have become familiar with this information.

## 4.1 Before Operating Washer



**WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:** Washer chemicals are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow precautions and instructions on chemical label and in Material Safety Data Sheet (MSDS) prior to handling detergent containers, or servicing detergent injection pumps, tank, and lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling chemicals or servicing chemical injection pumps, tank, and lines.



**CAUTION – POSSIBLE EQUIPMENT DAMAGE:**

- Always use non-foaming chemical for effective cleaning and proper pump and water level control operation. Follow manufacturer's recommendations for amount of chemical to be used.
- When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.

Become familiar with location and function of all major components and controls, as well as their function before operating equipment.

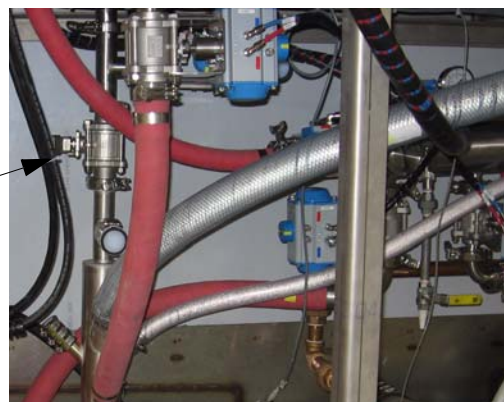
1. Verify building electrical supply disconnect switch (circuit breaker) is positioned to ON. Verify steam and water supply valves are open.
2. Open chamber door. Verify chamber is empty and all material has been removed.
3. Verify debris screens in bottom of sump are clean and properly installed.
4. Open printer door and check sufficient amount of printer paper is available.

**NOTE:** A colored warning stripe is visible when printer paper roll is near the end. Refer to SECTION 6.7, *PRINTER PAPER*, if paper is needed.

5. Ensure manual drain valves on bottom of detergent tanks and, if applicable, optional acid detergent tank are closed (see Figure 4-1).
6. Verify detergent supply (provided by customer). Check sufficient amount of detergent is available (Refer to SECTION 6.6.5, *REPLACING DETERGENT CONTAINER*). Ensure supply hose(s) is correctly placed in detergent container(s) and detergent pump(s) is turned on.





**NOTE:** Always use a non-foaming detergent for effective cleaning and proper pump and water level control operation. To achieve maximum cleaning efficiency, select detergent appropriate to soil type being processed.

Manual Drain Valve



**Figure 4-1. Manual Drain Valve**

## 4.2 How to Load Washer

 <b>WARNING – PERSONAL INJURY HAZARD:</b> <ul style="list-style-type: none"> <li>• Keep fingers away from door hinges to prevent pinching.</li> <li>• To prevent tipping, place biggest and heaviest items on the lower levels of accessory cart.</li> </ul>
 <b>WARNING – BURN HAZARD:</b> When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.
 <b>WARNING – SLIPPING HAZARD:</b> To avoid slippery floor conditions, keep floor dry. Promptly wipe up any spilled liquids or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).
 <b>CAUTION – POSSIBLE EQUIPMENT DAMAGE:</b> <ul style="list-style-type: none"> <li>• Avoid product damage. Always select a cycle appropriate for items being processed.</li> <li>• Before operating unit, always position manifolded Bottle Washing Cart over central water inlet connector. If manifolded accessory is not positioned correctly, damage may result and unit will be unable to effectively wash load.</li> <li>• Do not process load using Bottle Washing Cart when Automatic Floor Tilting option is activated. If Automatic Floor Tilting is used, manifolded water inlet and washer will be damaged.</li> </ul>

To properly clean items and avoid personal injuries, always follow these general guidelines:

1. Remove gross soil before processing in washer.
2. Use appropriate accessory racks within cart to load items such as bottles.
3. Assure no items stick out or hang out of the accessory cart.
4. Place biggest and heaviest items on the lower levels of accessory cart.
5. As an example, proper placement of items in Washing Cart would be as follows, from the top down

**Accessories** (see Figure 4-2):

- **Bottle Washing Cart** – Used for processing up to six bottle baskets. Requires Manifold Coupling System.
- **Pan Cart** – Used to wash pans, floor gratings, cage doors, etc.
- **Universal Cage and Wash Cart** – Used to wash 54 standard mouse boxes or 36 standard rat boxes.
- **Rodent Cage Rack** – Used to hold up to 92 mouse cages or 32 rat cages, or shoe boxes, covers, and feeder tops.

**IMPORTANT:** Use baskets for handling and cleaning various size bottles. Lightweight basket design provides easy handling and simplifies transport and washing of bottles.

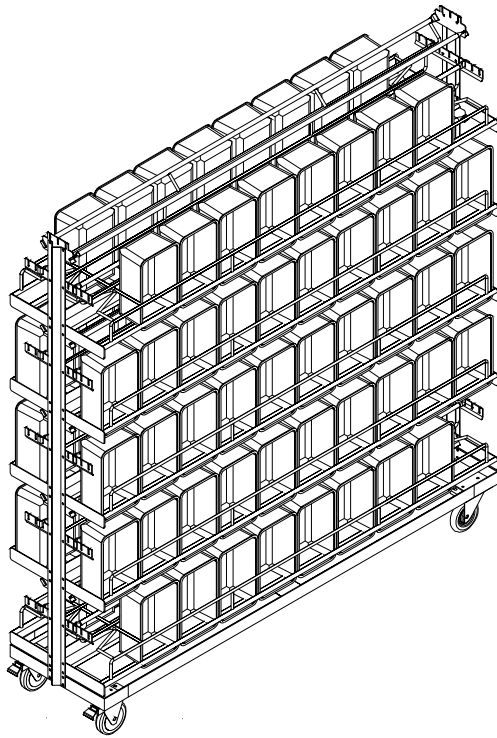
- **5 x 5 Bottle Basket** – Used to wash 25, 16 oz (454 mL) bottles.
  - **4 x 6 Bottle Basket** – Used to wash 24, 16 oz (454 mL) bottles.
  - **5 x 5 Bottle Basket** – Used to wash 25 short 4" (10 cm) bottles.
  - **4 x 6 Bottle Basket** – Used to wash 24 tall 5-1/2" (14 cm) bottles.
6. Open chamber door and push loaded wash cart(s) into wash chamber.
    - a. Ensure all cages, racks, etc. are correctly positioned on wash cart(s).
    - b. Position cart(s) in center of wash chamber. Verify clearance space on both sides of cart permits unobstructed movement of oscillating jet system.
  7. Close and latch chamber doors securely.

**NOTE:** Door safety switch prevents cycle operation unless door(s) is closed.

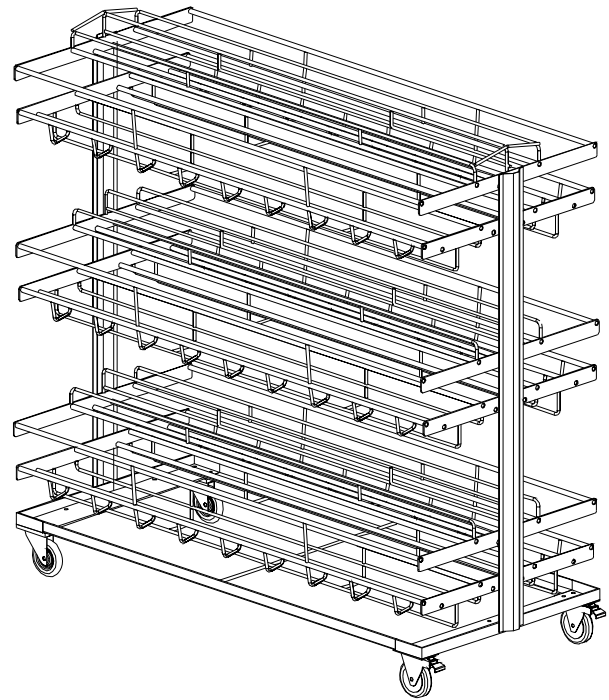
8. Start desired cycle.



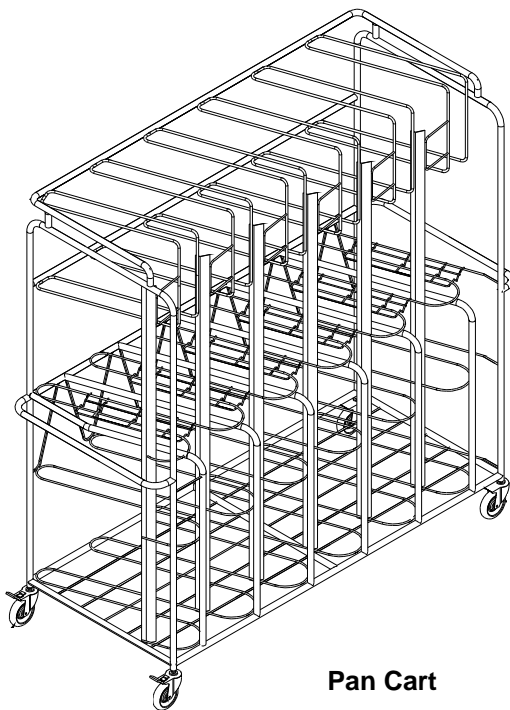
**CAUTION – POSSIBLE EQUIPMENT DAMAGE:** Remove all cellulose-type bedding from cages and pans before processing. Cellulose bedding can clog filters and piping.



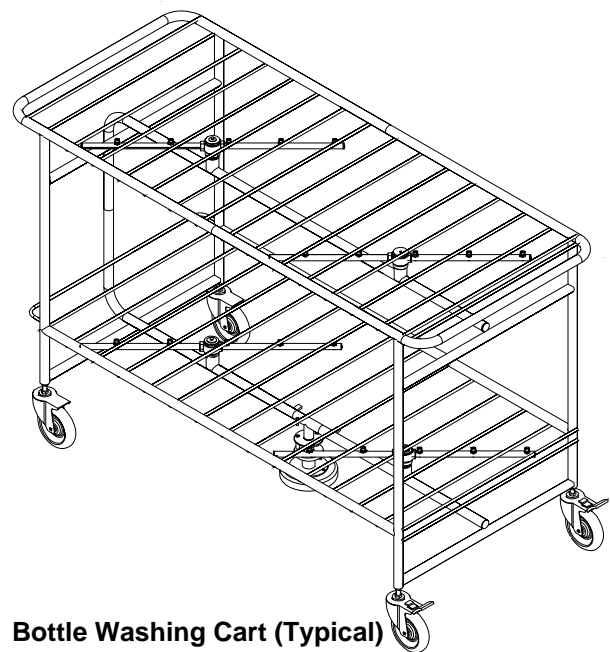
**Rodent Cage Rack**



**Universal Cage and Pan Wash Cart**



**Pan Cart**



**Bottle Washing Cart (Typical)**

**Figure 4-2. Accessories**

## 4.3 Cycle Operation

**Table 4-1. Demonstration Cycle Phase Values**

Cycle Phase	Time (minutes)	Temperature
Pre-Wash	1:00	HTW
Wash	5:00	140°F (60°C)
Rinse 1	1:30	180°F (82°C)
Rinse 2	1:30	180°F (82°C)
Final Rinse	1:30	180°F (82°C)
Exhaust	1:30	N/A

**Basil® 4600 Cage and Rack Washer** and **Basil® 4602 Cage and Rack Washer** are equipped with a microcomputer control capable of storing parameters for twelve distinct cycles. Authorized operators have capability of customizing/programming all cycles to meet specific washing needs. For instructions on cycle programming or changing cycle parameters, refer to *SECTION 5, CYCLE PROGRAMMING*.

On initial receipt of washer, each cycle is set with a basic demonstration cycle consisting of six sequential phases – Pre-wash, Wash, Rinse 1, Rinse 2, Final Rinse and Exhaust. Refer to **Table 4-1** for phase values of demonstration cycle.

To begin cycle operation:

1. Set POWER-OFF/STANDBY switch, located behind printer door, to POWER.

Unit name temporarily appears on screen, then screen displays first cycle menu:

**CYCLE 1**                      **CYCLE 2**  
**CYCLE 3**                      **CYCLE 4**

\_\_\_ indicates flashing position.

and printer records:

\* CONTROL ON                      8:32:31A  
   4/21/05

**NOTE:** If printer does not print when POWER-OFF/STANDBY switch is set to POWER, press top of Printer Function Switch to turn printer on.



2. Press **CYCLE MENU** touch pad until desired cycle menu appears on screen. Display shows:

**CYCLE 9**                      **CYCLE 10**  
**CYCLE 11**                      **CYCLE 12**

\_\_\_ indicates flashing position.



3. Press **SELECT CYCLE** touch pad until desired cycle name flashes.

**CYCLE 9**                      **CYCLE 10**  
**CYCLE 11**                      **CYCLE 12**

\_\_\_ indicates flashing position.



4. When desired cycle name is flashing, press **CYCLE/START** touch pad. Name of selected cycle appears on screen and remains displayed for five seconds.

**PRESS START TO  
PROCESS CYCLE 10**



5. To start selected cycle, press **CYCLE/START** touch pad a second time while selected cycle name is displayed on screen.

**NOTE:** If CYCLE/START is not pressed a second time while selected cycle name is displayed, screen automatically returns to cycle menu.

Once selected cycle is started, printer records:

CYCLE - CYCLE 10

```
-----
CYCLE START      8:37:33A
CYCLE DATE       4/24/05
CYCLE NUMBER     00000001
UNIT NUMBER      3600000000
```

```
PHASE           TIME           F
```

6. Washer automatically progresses through selected cycle as follows:

*NOTE: For cycle operation, note the following:*

- 1) *Time displayed on screen counts down time remaining for cycle phase in progress. If Temperature Guarantee feature is selected, time displayed for that phase only counts down when solution/ water temperature in chamber sump is equal to or greater than setpoint.*
- 2) *Cycle operation may be halted at any time by pressing STOP/ RESET touch pad once. To resume cycle operation at beginning of interrupted phase function (i.e., fill, recirculate, drain), press CYCLE/START. To abort cycle operation, press STOP/RESET a second time.*

- **PRE-WASH PHASE**

- >> Hot water, from building supply, fills sump until required water level is attained.

*NOTE: Sump may contain rinse water retained from previous cycle.*

Display shows:

```
CYCLE 10      135.7f
PREWASH FILL  T=2:00
```

- >> Pre-wash water recirculates through oscillating jet system for programmed time interval. Display shows:

```
CYCLE 10      139.5F
PREWASH       T=1:00
```

Printer records time and water temperature in chamber sump at beginning and end of recirculation:

```
PREWASH      10:18:15A  139.5
              10:19:15A  135.0
```

- **pH NEUTRALIZATION (Option)**

- >> pH analyzer is initialized. Display shows:

```
STANDBY -
NEUTRALIZING SUMP
```

>> pH analyzer checks to see if value is within limits. Display shows:

**CHECKING pH**  
**pH = XX.XXX**

>> **If pH is too low while injecting**, acid Neutralizer is injected to compensate. Display shows:

**pH TOO LOW**  
**INJECTING ACID NEUT.**

>> Water-Acid neutralizer solution is mixed. Display shows:

**pH TOO LOW**  
**MIXING WATER**

>> **If pH is too high while injecting**, alkaline neutralizer is injected to compensate. Display shows:

**PH TOO HIGH**  
**INJECTING ALK. NEUT.**

>> Water-Alkaline neutralizer solution is mixed. Display shows:

**pH TOO HIGH**  
**MIXING WATER**

>> Water contained in traveling spray header is sent to sump (all units). Display shows:

**CYCLE 10**                      **128.5F**  
**HEADER DRAIN**            **T= 1:00**

>> Sump water is pumped to drain. Display shows:

**CYCLE 10**                      **128.5F**  
**PREWASHDRAIN**          **T= 1:00**

>> Water still present in sump is gravity-drained (option). Displays shows:

**CYCLE 10**                      **128.5F**  
**GRAVITY DRAIN**           **T= 1:00**

- **ALKALINE WASH PHASE**

>> Hot water, from alkaline wash tank, fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10**                      **(G=)137.4F**  
**ALK. WASH FILL**           **T= 2:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than setpoint.*

>> Water is heated while recirculating (CONDUCTIVITY OPTION ONLY). If temperature is guaranteed actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=)141.5F**  
**RECIRC./HEATING T= 5:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than setpoint.*

>> Alkaline detergent is injected into sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=)141.5F**  
**INJECTING ALK. T= 5:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than setpoint.*

>> Detergent solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=)140.4F**  
**ALKALINE WASH T= 5:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than setpoint.*

Printer records time and solution temperature in chamber sump at beginning and end of recirculation:

ALK. WASH	10:21:55A	141.5
	10:26:55A	140.2

- **TIME-BASED pH NEUTRALIZATION (Option)**

Alkaline neutralizer is injected during programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 167.8**  
**ALK.NEUTRALIZE T = 2:00**

- **CONTROLLER-DRIVEN pH NEUTRALIZATION (Option)**

>> pH analyzer is initialized. Display shows:

**STANDBY**  
**NEUTRALIZING SUMP**

>> pH analyzer checks to see if value is within limits. Display shows:

**CHECKING pH**  
**pH = XX.XXX**

>> **If pH is too low while injecting**, acid neutralizer is injected to compensate. Display shows:

**pH TOO LOW  
INJECTING ACIDNEUT.**

>> Water-Acid neutralizer solution is mixed. Display shows:

**pH TOO LOW  
MIXING WATER**

>> **If pH is too high while injecting**, alkaline neutralizer is injected to compensate. Display shows:

**pH TOO HIGH  
INJECTING ALK.NEUT.**

>> Water-Alkaline neutralizer solution is mixed. Display shows:

**pH TOO HIGH  
MIXING WATER**

>> Water contained in traveling spray header is sent to sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Displays shows:

**CYCLE 10                      (G=) 128.5F  
HEADER DRAIN              T= 1:00**

>> Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=)128.5F  
ALK.DRAIN                  T= 1:00**

>> Water still present in sump is gravity-drained (option). If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=)128.5F  
GRAVITYDRAIN              T= 1:00**

>> **If water saver is enabled**, sump water is sent back to alkaline tank. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=)138.7F  
ALK.SAVER                  T= 2:00**

>> **If sump flush option is available**, water still present in sump is gravity drained. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 128.5F  
FLUSH DRAIN              T= 00:45**

>> **If sump flush option is available**, water is injected in sump to remove debris. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 128.5F  
FLUSHFILL                  T= 2:00**

- >> **If sump flush option is available**, refreshed water still present in sump is gravity drained. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10**                      **(G=) 128.5F**  
**FLUSHDRAIN**                **T= 2:00**

- **ACID WASH PHASE**

- >> Hot water, from building supply (or from acid wash tank, if option applies) fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10**                      **(G=) 137.4F**  
**ACIDWASHFILL**               **T= 2:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than set-point.*

- >> Water is heated while recirculating (CONDUCTIVITY OPTION ONLY). If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10**                      **(G=) 141.5F**  
**RECIRC/HEATING**            **T= 5:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than set-point.*

- >> Acid detergent is injected into sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10**                      **(G=) 141.5F**  
**INJECTINGACID**               **T= 5:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than set-point.*

- >> Detergent solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10**                      **(G=) 140.0F**  
**ACIDWASH**                    **T= 5:00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal or greater than set-point.*

Printer records time and solution temperature in chamber sump at the beginning and end of recirculation:

ACID WASH      10:21:55A 141.5  
                    10:26:55A 140.2

>> Load is soaked in Acid solution for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 167.8F**  
**ACIDSOAK                    T= 2:00**

- **TIME-BASED pH NEUTRALIZATION (Option)**

>> Acid neutralizer is injected during programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 167.8F**  
**ACIDNEUTRALIZ            T= 2:00**

- **CONTROLLER-DRIVEN pH NEUTRALIZATION (Option)**

>> pH analyzer is initialized. Display shows:

**STANDBY**  
**NEUTRALIZING SUMP**

>> pH analyzer checks to see if value is within limits. Display shows:

**CHECKING pH**  
**pH=XX.XXX**

>> **If pH is too low while injecting**, acid neutralizer is injected to compensate. Display shows:

**pH TOO LOW**  
**INJECTING ACIDNEUT**

>> Water-Acid neutralizer solution is mixed. Display shows:

**pH TOO LOW**  
**MIXINGWATER**

>> **If pH is too high while injecting**, alkaline neutralizer is injected to compensate. Display shows:

**pH TOO HIGH**  
**INJECTING ALK.NEUT.**

>> Water-Alkaline neutralizer solution is mixed. Display shows:

**pH TOO HIGH**  
**MIXING WATER**

>> Water contained in traveling spray header is sent to sump. If temperature is guaranteed, actual sump temperature

alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**HEADERDRAIN T= 1:00**

- >> Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**ACID DRAIN T= 1:00**

- >> Water still present in sump is gravity-drained (option). If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**GRAVITY DRAIN T= 1:00**

- >> **If water saver is enabled**, sump water is sent back to acid tank (if option applies). If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 138.7F**  
**ACID SAVER T= 2:00**

- >> **If sump flush option is available**, water still present in sump is gravity-drained. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**FLUSHDRAIN T= 00.45**

- >> **If sump flush option is available**, water is injected in sump to remove debris. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**FLUSHDRAIN T= 00.30**

- >> **If sump flush option is available**, refreshed water still present in sump is gravity-drained. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**FLUSHDRAIN T= 00.45**

- **RINSE 1 PHASE**

- >> Hot water, from building supply, fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 137.4F**  
**RINSE1FILL T= 2.00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal to or greater than set-point.*

- >> Rinse 1 water is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 140.0F**  
**RINSE 1                      T= 5.00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal to or greater than set-point.*

Printer records time and solution temperature in chamber sump at beginning and end of recirculation:

RINSE 1	10:21:55A	141.5
	10:26:55A	140.2

- **CONTROLLER-DRIVEN pH NEUTRALIZATION (Option)**

- >> pH analyzer is initialized. Display shows:

**STANDBY**  
**NEUTRALIZINGSUMP**

- >> pH analyzer checks to see if value is within limits. Display shows:

**CHECKINGpH**  
**pH=XX.XXX**

- >> **If pH is too low while injecting**, acid neutralizer is injected to compensate. Display shows:

**pH TOO LOW**  
**INJECTING ACIDNEUT.**

- >> Water-Acid neutralizer solution is mixed. Display shows:

**pH TOO LOW**  
**MIXING WATER**

- >> **If pH is too high while injecting**, alkaline neutralizer is injected to compensate. Display shows:

**pH TOO HIGH**  
**NJECTING ALK.NEUT.**

- >> Water-Alkaline neutralizer solution is mixed. Display shows:

**pH TOO HIGH**  
**MIXING WATER**

- >> Water contained in traveling spray header is sent to sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10** (G=) 128.5F  
**HEADERDRAIN** T= 1.00

>> Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10** (G=) 128.5F  
**rinse1DRAIN** T= 1.00

>> Water still present in sump is gravity-drained (option). If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

**CYCLE 10** (G=) 128.5F  
**GRAVITYDRAIN** T= 1.00

- **RINSE 2 PHASE**

>> Hot water, from building supply, fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10** (G=) 137.4F  
**RINSEFILL** T= 2.00

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal to or greater than set-point.*

>> Rinse 2 solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10** (G=) 140.0F  
**RINSE2** T= 5.00

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal to or greater than set point.*

Printer records time and solution temperature in chamber sump at beginning and end of recirculation:

RINSE 2	10:21:55A	141.5
	10:26:55A	140.2

- **CONTROLLER-DRIVEN pH NEUTRALIZATION (Option)**

>> pH analyzer is initialized. Display shows:

**STANDBY  
NEUTRALIZINGSUMP**

>> pH analyzer checks to see if value is within limits. Display shows:

**CHECKINGpH  
pH=XX.XXX**

>> pH too low while injecting. Acid neutralizer is injected to compensate. Display shows:

**pH TOO LOW  
INJECTINGACIDNEUT**

>> Water-Acid neutralizer solution is mixed. Display shows:

**pH TOO LOW  
MIXING WATER**

>> If pH is too high while injecting, alkaline neutralizer is injected to compensate. Display shows:

**pH TOO HIGH  
INJECTINGALK.NEUT.**

>> Water-Alkaline neutralizer solution is mixed. Display shows:

**pH TOO HIGH  
MIXING WATER**

>> Water contained in traveling spray header is sent to sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 128.5F  
HEADERDRAIN                T= 1.00**

>> Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 128.5F  
RINSE2DRAIN                T= 1.00**

>> Water still present in sump is gravity-drained (option). If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 128.5F  
GRAVITYDRAIN               T= 1.00**

- **FINAL RINSE PHASE**

>> Hot water, from building supply, fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10                      (G=) 137.4F  
F.RINSEFILL                 T= 2.00**

*NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time only counts down when solution temperature is equal to or greater than set-point.*

- >> Final Rinse solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 140.5F**  
**FINAL RINSE T= 5.00**

Printer records time and solution temperature in chamber sump at beginning and end of recirculation:

F. RINSE	10:21:55A	141.5
	10:26:55A	140.2

- **CONTROLLER-DRIVEN pH NEUTRALIZATION (Option)**

- >> pH analyzer is initialized. Display shows:

**STANDBY**  
**NEUTRALIZINGSUMP**

- >> pH analyzer checks to see if value is within limits. Display shows:

**CHECKINGpH**  
**pH=XX.XXX**

- >> **If pH is too low while injecting**, acid neutralizer is injected to compensate. Display shows:

**pH TOO LOW**  
**INJECTINGACIDNEUT.**

- >> Water-Acid neutralizer solution is mixed. Display shows:

**pHTOO LOW**  
**MIXING WATER**

- >> **If pH is too high while injecting**, alkaline neutralizer is injected to compensate. Display shows:

**pH TOO HIGH**  
**INJECTING ALK.NEUT.**




- >> Water-Alkaline neutralizer solution is mixed. Display shows:

**pH TOO HIGH**  
**MIXING WATER**

- >> Water contained in traveling spray header is sent to sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**HEADERDRAIN T= 1.00**

- >> Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with

	<p><b>WARNING – PERSONAL INJURY HAZARD:</b></p> <p>Items in washing cart may move during processing and be filled with residual hot water or protrude from cart at the end of the cycle. Always wear appropriate personal protective equipment (PPE) and carefully remove items from cart.</p>
	<p><b>WARNING – BURN HAZARD:</b></p> <ul style="list-style-type: none"> <li>• Inner surfaces of washer are very hot after cycle completion. Operator should wear appropriate Personal Protective Equipment (PPE) and avoid all contact with inner walls when entering chamber to unload washer.</li> <li>• When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.</li> </ul>
	<p><b>WARNING – SLIPPING HAZARD:</b></p> <p>To avoid slippery floor conditions, keep floor dry. Promptly wipe up any spilled liquids or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).</p>

guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**F.RINSEDRAIN T= 1.00**

>> Water still present in sump is gravity-drained (option). If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature. Display shows:

**CYCLE 10 (G=) 128.5F**  
**GRAVITYDRAIN T= 1.00**

#### • EXHAUST PHASE

>> Washer stands idle for programmed time interval allowing residual vapors to exhaust from wash chamber to room. Display shows:

**CYCLE 10 T= 1.30**  
**EXHAUST**

Printer records time at completion of phase:

EXHAUST 10:38:05A

*NOTE: Customer must connect exhaust vent to building exhaust system to prevent directly exhausting vapors to room.*

#### • CYCLE COMPLETE

>> Alarm buzzer sounds and an operator instruction is displayed. Alarm buzzer can be silenced by pressing Alarm Reply touch pad or opening chamber door(s). Instruction remains on screen until door(s) is opened. Display shows:

**PLEASE OPEN DOOR  
AND REMOVE THE LOAD**

Printer records:

COMPLETE 10:39:35A  
MAX WASH TEMP = 141.5F  
MAX RINSE TEMP = 180.8F  
CYCLE TIME = 0:23:15

-----  
READY TO UNLOAD  
-----

>> Cautiously open chamber door to vent remaining steam vapors. Allow chamber to cool a few minutes before removing load. Display returns to Cycle Menu:

**CYCLE 9 CYCLE 10**  
**CLE 11 CYCLE12**

\_\_\_indicates flashing position

And printer records:

DOOR OPENED 10:42:10A  
-----

## 4.4 Review and Print Specific Cycle Program

All cycle programs may be reviewed by accessing Cycle Review mode when a cycle is not in progress. Cycle Review mode allows user to review and printout cycle phases and values programmed for specific cycle selected.



1. Press **CYCLE MENU** touch pad until desired cycle menu appears on screen:

<b>CYCLE 5</b>	<b>CYCLE 6</b>
<b>CYCLE 7</b>	<b>CYCLE 8</b>

\_\_\_ indicates flashing position.



2. Press **SELECT CYCLE** touch pad until desired cycle name flashes:

<b>CYCLE 5</b>	<b>CYCLE 6</b>
<b>CYCLE 7</b>	<b>CYCLE 8</b>

\_\_\_ indicates flashing position.



3. Press **REVIEW CYCLE** touch pad to access Cycle Review mode, and review first phase of selected cycle.

<b>CYCLE 6</b>	<b>HTW</b>
<b>PRE-WASH</b>	<b>(E)T= 01:00</b>



4. Continue to press **REVIEW CYCLE** to sequentially review each phase of selected cycle.

<b>CYCLE 6</b>	<b>SP=180.0F</b>
<b>FINAL RINSE</b>	<b>(E)T= 01:30</b>

*NOTE: For Cycle Review mode, note the following:*

- 1) *Cycle Review mode also permits user to review programmed solution temperature setpoint and actual detergent solution temperature in detergent tank.*
- 2) *Extended treatment time is shown by an "E" before actual time.*
5. Press **REVIEW CYCLE** touch pad until print message appears on screen (if printer option is enabled).



<b>PRINT CYCLE VALUES?</b>	
<b>REVIEW = YES</b>	<b>STOP = NO</b>



6. To generate a printout of reviewed cycle phases and values, press **REVIEW CYCLE** touch pad. Display screen returns to first phase of selected cycle:

<b>CYCLE 6</b>	<b>HTW</b>
<b>PREWASH</b>	<b>T= 01:00</b>

... and printer records:

CYCLE PROGRAM REVIEW  
CYCLE - CYCLE 6

REVIEW TIME	5:18:25P
REVIEW DATE	4/24/05
UNIT NUMBER	3600000

PHASE	TIME	F
PRE-WASH	01:00	HTW
DET-WASH	05:00	
WATER DRAIN		
TANK TEMP		140.0
RINSE 1	01:30	
RINSE 2	03:00	180.0
F. RINSE	01:30	180.0G
EXHAUST	01:30	-----

*NOTE: At this point, user may either initiate selected cycle or exit Cycle Review mode. To initiate selected cycle, press CYCLE/START touch pad twice. To exit Cycle Review mode, press CYCLE MENU touch pad. Control exits mode and returns display screen to selected cycle menu.*



- To bypass printout option, press **STOP/RESET** touch pad. Control exits Cycle Review mode and display screen returns to selected cycle menu:

**CYCLE 5**  
**CYCLE 7**

**CYCLE 6**  
**CYCLE 8**

     indicates flashing position.



**WARNING – BURN HAZARD:**

- Inner surfaces of washer are very hot after cycle completion. Operator should wear appropriate Personal Protective Equipment (PPE) and avoid all contact with inner walls when entering chamber to unload washer.
- When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.

## 4.5 Stop Cycle Operation



1. Press **STOP/RESET** touch pad to immediately halt operation of cycle in progress. Display screen indicates that cycle is/was stopped:

**CYCLE 4  
CYCLE STOPPED!**

... and printer records:

RINSE 1                      2:54:48p                      181.3  
\* ALARM    2:55:00P  
STOP BUTTON PRESSED



2. Press **CYCLE/START** touch pad to resume cycle operation at beginning of interrupted phase function (i.e., fill, recirculate, drain). Phase resets to beginning of interrupted function,

**CYCLE 4                      180.5F  
RINSE 1                      T= 1:30**

... and printer records:

\* CYCLE RESUMED                      2:55:22P  
RINSE 1                      2:55:23P                      180.5

## 4.6 Abort Cycle Operation



**WARNING – PERSONAL INJURY HAZARD:** Items in washing cart may move during processing and be filled with residual hot water or protrude from cart at the end of the cycle. Always wear appropriate personal protective equipment (PPE) and carefully remove items from cart.

1. Press **STOP/RESET** touch pad to halt cycle in progress.
2. Press **STOP/RESET** touch pad a second time to abort cycle. Display screen indicates that cycle was aborted,

**CYCLE ABORT...**

... and printer records:

\* CYCLE ABORT                      2:54:48P

Control automatically returns screen to selected cycle menu:

**CYCLE 1                      CYCLE 2  
CYCLE 3                      CYCLE 4**

\_\_\_ indicates flashing position.

## 4.7 Extend Cycle Phase Time

Cycle phase times may be temporarily extended by pressing Extend Phase touch pad either while cycle is in progress or prior to initiating cycle during cycle program review. Temporarily extended phase times apply only to immediate cycle selected. On completion of cycle, phase times return to programmed setpoints.

### 4.7.1 During a Cycle

After starting a cycle, programmed time for each phase may be temporarily extended only when particular phase process is in operation.

**CYCLE 6**  
**RINSE 2**

**182.7F**  
**T= 1:30**



To extend phase time, press **EXTEND PHASE** touch pad while actual phase process (i.e., recirculating, exhausting) is in operation. Each time touch pad is pressed, programmed time setpoint is added to phase time remaining:

**CYCLE 6**  
**RINSE 2**

**182.7F**  
**ET= 2:00**

... and printer records:

RINSE 1	4:09:49	182.6
	4:11:19P	182.5
RINSE 2	4:14:10P	182.7
RINSE 2 PHASE EXT.	4:15:39P	
	4:17:39P	182.4
F. RINSE	4:20:22p	182.6

*NOTE: Filling and draining functions are not affected by extend phase feature. If EXTEND PHASE touch pad is pressed during these functions, cycle continues as programmed.*

### 4.7.2 Prior to Starting a Cycle



1. Once desired cycle is selected, press **REVIEW CYCLE** touch pad to access Cycle Review mode. Continue to press **REVIEW CYCLE** touch pad to advance screen to desired phase.

**CYCLE 6**  
**RINSE 2**

**SP=180.0F**  
**T=01:30**



2. With correct cycle phase displayed, press **EXTEND PHASE**. Programmed phase time is temporarily doubled. If Extend Phase is pressed again, phase time returns to original programmed time setpoint.

**CYCLE 6**  
**RINSE 2**

**SP=180.0F**  
**ET=03:00**

*NOTE: While in Cycle Review mode, pressing EXTEND PHASE touch pad only allows operator to double programmed phase*

time. If a longer phase time is desired, programmed time setpoint must either be manually extended during cycle or adjusted in Change Values mode prior to starting cycle.



- Press **REVIEW CYCLE** touch pad until print message appears on screen (if printer option is enabled):

**PRINT CYCLE VALUES?**  
**REVIEW =YES      STOP = NO**

*NOTE: To run cycle with extended phase times, cycle must be started while in Cycle Review mode. To remain in Cycle Review mode, operator must answer YES to print message by pressing REVIEW CYCLE touch pad. If operator answers NO by pressing STOP/RESET touch pad control exits Cycle Review mode, display screen returns to cycle menu and any adjustments made while in Cycle Review mode are erased.*



- Press **REVIEW CYCLE** touch pad to generate a printout of reviewed cycle values and return display screen to first phase of selected cycle. An "E" is printed next to each extended phase time:

```

CYCLE PROGRAM REVIEW
CYCLE -CYCLE 6
REVIEW TIME           5:18:25
PREVIEW DATE          4/24/05
UNIT NUMBER           3600000
PHASE                 TIME      F
PRE-WASH              01:00     HWT
DET-WASH              05:00     140.0
WATER DRAIN
TANK TEMP              140.0
RINSE 1               01:30     180.0
RINSE 2               03:00     180.0
F. RINSE              01:30     180.0G
EXHAUST               01:30     -----

```

**WARNING – SLIPPING HAZARD:** To avoid slippery floor conditions, keep floor dry. Promptly wipe up any spilled liquids or condensations. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).



- Press **CYCLE/START** touch pad twice to initiate cycle. Cycle automatically progresses through each phase as temporarily adjusted in Cycle Review mode.

*NOTE: Cycle may be started at any point in Cycle Review mode.*

- On completion of cycle, alarm buzzer sounds and an operator instruction is displayed.
- When door(s) is opened, display screen returns to first cycle menu, control exits Cycle Review mode and phase times return to programmed time setpoints.

**WARNING – BURN HAZARD:** Inner surfaces of washer are very hot after cycle completion. Operator should wear appropriate Personal Protective Equipment (PPE) and avoid all contact with inner walls when entering chamber to unload washer.

**WARNING – BURN HAZARD:** When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.

## 4.8 Bypass Phase

A cycle phase may be bypassed only if Temperature Guarantee is not selected and cycle in progress is not locked out by an access code. Access code prevents unauthorized bypassing of phases and/or changing cycle phase values. Refer to *SECTION 5, PROGRAMMING VALUES WITH ACCESS CODE ENABLED*, for details on access code feature.

If Temperature Guarantee is not selected, cycle phase may be bypassed only while particular phase process is in operation. Bypassed phases apply only to immediate cycle in progress.



1. To bypass a phase, press **BYPASS PHASE** touch pad while actual phase process (i.e., recirculating, exhausting) is in operation:

**CYCLE 8                      181.3F**  
**PREWASH                    T= 1:00**

2. Control aborts phase process in operation and automatically continues with next programmed function:

**CYCLE 8                      154.6F**  
**PREWASHDRAIN            T= 1:00**

... and printer records:

PHASE	TIME	F
PRE-WASH	2:44:08P	181.3
BYPASSED PHASE	2:44:53P	
DET-WASH	2:46:53P	181.4
	2:51:53P	181.1
RINSE 1	2:54:48P	181.3

*NOTE: Filling and draining functions can not be bypassed. If BYPASS PHASE touch pad is pressed during these functions, control automatically resets timer and begins filling/draining function again.*

## 4.9 Shutdown Procedure



**WARNING – BURN HAZARD:**  
When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.

At end of a work session, washer should be shut down and cleaned thoroughly. Refer to *SECTION 6, ROUTINE MAINTENANCE*, for complete cleaning instructions and scheduled minor maintenance.

1. Access Manual Control mode (refer to *SECTION 4.10.1, ACCESSING MANUAL CONTROL MODE*), and drain washer sump.
2. Position POWER-OFF/STANDBY switch to OFF/STANDBY.
3. Position building electrical disconnect switch to OFF and close building supply valves.
4. Open manual drain valves to completely drain detergent tank and optional acid tank, if desired.
5. Clean unit as described in *SECTION 6, ROUTINE MAINTENANCE*.
6. Ensure building electrical disconnect switch is positioned to ON after completion of cleaning and minor maintenance procedures.

*NOTE: Leaving disconnect switch in OFF position overnight shortens life span of battery backed-up control memory.*

## 4.10 Manual Control Mode

Operator or service technician can manually control certain washer functions by accessing Manual Control Mode. Manual Control Mode is accessible from Operating Mode when washer is not in a cycle.

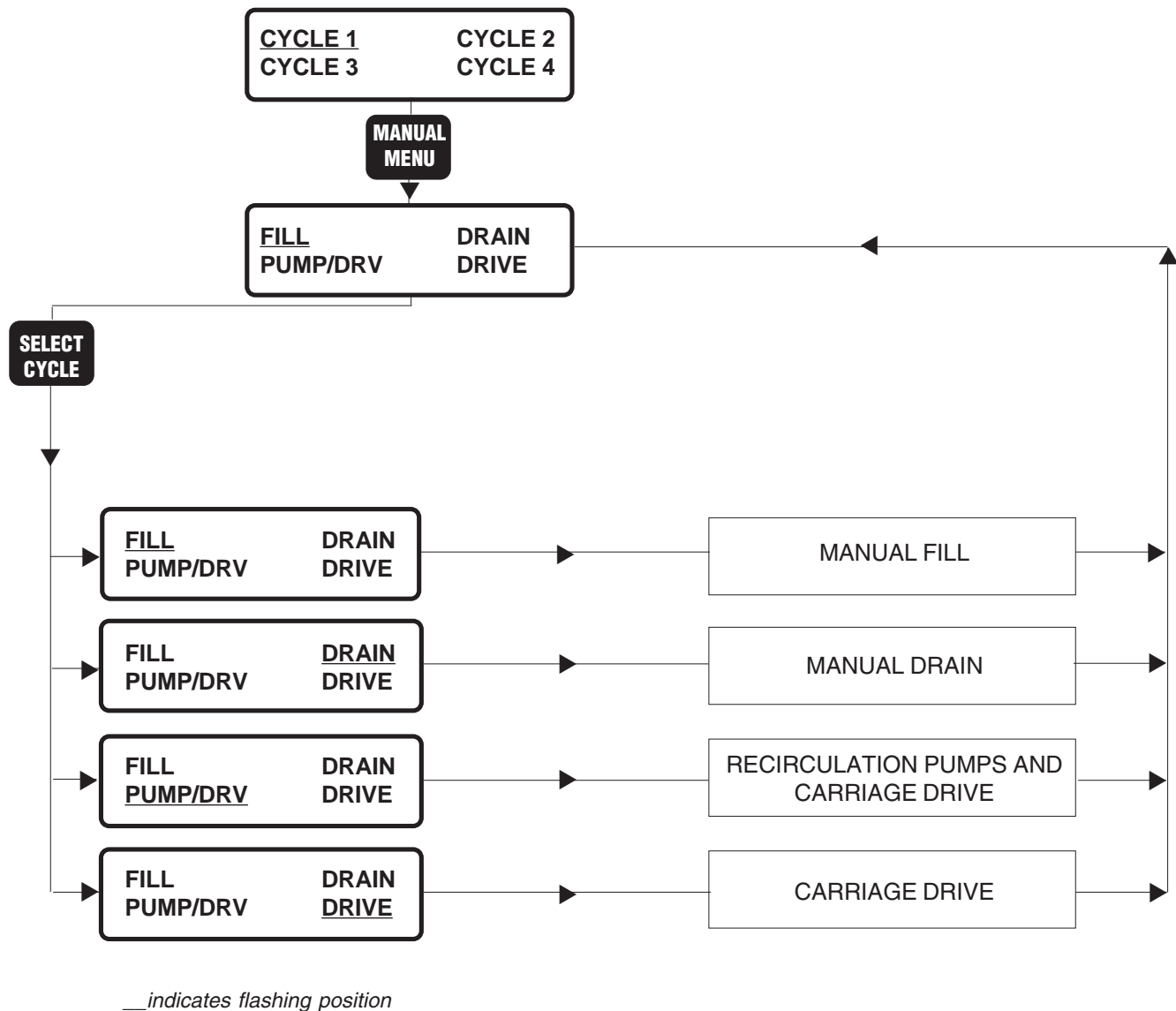


Figure 4-3. Manual Control Mode Flow Chart

### 4.10.1 Accessing Manual Control Mode



To access Manual Control mode:

1. From Cycle Menu, press **MANUAL MENU** touch pad. Display shows:

**CYCLE 1**                      **CYCLE 2**  
**CYCLE 3**                      **CYCLE 4**

\_\_\_ indicates flashing position.

2. Display momentarily shows:

**MANUAL CONTROL MENU**

After four seconds, display shows Manual Control menu:

**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.

3. To perform specific manual functions, refer to descriptions included in this section, titled same as shown on display screen. FILL selection allows manual filling of chamber sump. DRAIN selection allows manual draining of chamber sump and tanks. PUMP/DRV selection allows manual operation of recirculation pump(s) and oscillating jet system. DRIVE selection allows manual operation of carriage drive system while chamber door is open or closed.

### 4.10.2 FILL Function



To access Manual FILL function:

1. In Manual Control Menu, press **SELECT CYCLE** touch pad until FILL is flashing and press **CYCLE/START** touch pad. Display shows:

**FILLING SUMP...**  
**PRESS STOP TO ABORT**

*NOTE: If necessary, manual functions can be aborted at any time by pressing STOP/RESET touch pad.*

2. When sump is full, display shows:

**SUMP FULL**

After a two second delay, display returns to Manual Control Menu:

**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.

## 4.11 DRAIN Function

To access Manual DRAIN functions, proceed as follows:



1. From Manual Control Menu, press **SELECT CYCLE** touch pad until DRAIN is flashing. Display shows:

**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.



2. With DRAIN flashing, press **CYCLE/START** touch pad. Display shows DRAIN Menu:

**SUMP**                      **ALK.TANK**  
**ACIDTANK**              **COOLDOWN**

\_\_\_ indicates flashing position.

*NOTE: During Manual Drain, note the following:*

- 1) If Acid Tank Hardware and/or Cool Down Tank options are set OFF (set in Misc. Values function), Acid Tank and Cool Down selections do not appear on display screen.
- 2) If necessary, manual functions can be aborted at any time by pressing STOP/RESET touch pad.

### 4.11.1 Draining Sump

To drain sump manually, proceed as follows:



1. From Drain Menu, press **SELECT CYCLE** touch pad until SUMP is flashing. Display shows:

**SUMP**                      **ALK.TANK**  
**ACID TANK**              **COOLDOWN**

\_\_\_ indicates flashing position.



2. With SUMP flashing, press **CYCLE/START** touch pad. If sump is not already full, display shows:

**FILLING SUMP...**  
**PRESS STOP TO ABORT**

3. When sump is full, display shows:

**SUMP FULL**

After a delay of three seconds, jet valve(s) closes, sump drain valve(s) opens, and display shows:

**DRAININGSUMP...**  
**PRESS STOP TO ABORT**

4. Pump runs for DRAIN TIME. If unit is provided with a cooldown tank and cooldown tank is not empty, display shows:

**STANDBY - COOLDOWN**  
**TANK COOLING**

... and:

**STANDBY - COOLDOWN**  
**TANK DRAINING**

5. When cooldown tank (option) is empty, display shows:

**SUMP EMPTY**

After a two-second delay, display returns to DRAIN Menu:

**SUMP**                      **ALK.TANK**  
**ACID TANK**              **COOLDOWN**

       indicates flashing position.

#### 4.11.2 Draining Alkaline Tank

To drain Alkaline Tank manually, proceed as follows:



1. From Drain Menu, press **SELECT CYCLE** touch pad until ALK. TANK is flashing. Display shows:

**SUMP**                      **ALK.TANK**  
**ACID TANK**              **COOLDOWN**

       indicates flashing position.



2. With ALK. TANK flashing, press **CYCLE/START** touch pad. Display shows:

**ALK.TANK DRAINING**  
**PRESS STOP TO ABORT**

3. When sump is full, display shows:

**SUMP FULL**

4. After a three-second delay, jet valve(s) closes, sump drain valve(s) opens and treatment pump(s) turns on. Display shows:

**DRAINING SUMP...**  
**PRESS STOP TO ABORT**

5. Pump runs for DRAIN TIME. On completion, display shows:

**FILLING SUMP...**  
**PRESS STOP TO ABORT**

6. When sump is full, display shows:

**SUMP FULL**

7. After a three-second delay, jet valve(s) closes and sump drain valve(s) opens, treatment pump(s) is turned on. Display shows:

**DRAINING SUMP...**  
**PRESS STOP TO ABORT**

8. Pump runs for DRAIN TIME. On completion, display shows:

**ALK. TANK**  
**EMPTY**

After a two-second delay, display returns to DRAIN menu:

**SUMP**                      **ALK.TANK**  
**ACID TANK**              **COOLDOWN**

       indicates flashing position.

### 4.11.3 Draining Acid Tank



To drain Acid Tank manually, proceed as follows:

1. From Drain Menu, press **SELECT CYCLE** touch pad until ACID TANK is flashing. Display shows:

**SUMP**                      **ALK.TANK**  
**ACID TANK**              **COOLDOWN**

*\_\_\_ indicates flashing position.*



2. With ACID TANK flashing, press **CYCLE/START** touch pad. Display shows:

**ACID TANK DRAINING**  
**PRESS STOP TO ABORT**

3. When sump is full, screen display shows:

**SUMP FULL**

4. After a three-second delay, jet valve(s) closes and sump drain valve(s) opens, treatment pump(s) is turned on. Display shows:

**DRAINING SUMP...**  
**PRESS STOP TO ABORT**

5. Pump runs for DRAIN TIME. On completion, display shows:

**FILLING SUMP...**  
**PRESS STOP TO ABORT**

6. When sump is full, display shows:

**SUMP FULL**

7. After jet valve(s) closes and sump drain valve(s) opens, treatment pump(s) is turned on. Display shows:

**DRAINING SUMP...**  
**PRESS STOP TO ABORT**

8. Pump runs for DRAIN TIME. On completion, display shows:

**ACID TANK**  
**EMPTY**

After a two-second delay, display returns to DRAIN menu:

**SUMP**                      **ALK.TANK**  
**ACID TANK**              **COOLDOWN**

*\_\_\_ indicates flashing position.*

### 4.11.4 Draining Cooldown Tank



To drain Cooldown tank manually, proceed as follows:

1. From DRAIN Menu, press **SELECT CYCLE** touch pad until COOLDOWN is flashing. Display shows:

**SUMP**                      **ALK.TANK**  
**ACID TANK**              **COOLDOWN**

*\_\_\_ indicates flashing position.*



2. With COOLDOWN flashing, press **CYCLE/START** touch pad.

Display shows:

**STANDBY - COOLDOWN  
TANK COOLING**

*NOTE: If unit is provided with a controller-driven pH monitoring system, additional displays are shown.*

3. Display shows:

**STANDBY - COOLDOWN  
TANK DRAINING**

4. Solution is cooled down (and Cool Down water valve energized) for COOLDOWN TANK time. At end of neutralization phase (OPTION), displays shows:

**STANDBY - COOLDOWN  
TANK DRAINING**

5. When tank is empty, display shows:

**COOLDOWN TANK    EMPTY**

After a two-second pause, display returns to DRAIN Menu:

**SUMP                      ALK.TANK  
ACID TANK              COOLDOWN**

*\_\_\_ indicates flashing position.*

## 4.12 PUMP/DRV Function

To operate recirculation pump(s) and oscillating jet system manually:



1. From Manual Control MT= Menu, press **SELECT CYCLE** touch pad until PUMP/DRV is flashing. Display shows:

**FILL                      DRAIN  
PUMP/DRV              DRIVE**

*\_\_\_ indicates flashing position.*



2. With PUMP/DRV flashing, press **CYCLE/START** touch pad. If sump is not full, display shows:

**FILLING SUMP...  
PRESS STOP TO ABORT**

3. When sump is full, display shows:

**SUMP IS FULL**

After a two-second delay, display shows:

**PUMPING/DRIVING...  
PRESS STOP TO ABORT**

*\_\_\_ indicates flashing position.*

*NOTE: Recirculation pump(s) and oscillating jet system continue to operate until Stop/Reset is pressed.*

4. Press **STOP/RESET** touch pad when done. Display returns to Manual Control Menu:

**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.

## 4.13 DRIVE Function

To operate carriage drive system manually:



1. From Manual Control Menu, press **SELECT CYCLE** touch pad until DRIVE is flashing. Display shows:

**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.



2. With DRIVE flashing, press **CYCLE/START** touch pad. Display shows:

**DRIVING...**  
**PRESS STOP TO ABORT**

Carriage oscillates with doors open or closed.

*NOTE: Carriage will continue to oscillate until Stop/Reset is pressed.*



3. Press **STOP/RESET** touch pad when done. Display returns to Manual Control Menu.

**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.

## 5.1 Program Touch Pads



Figure 5-1. Program Touch Pads

Microcomputer control of **Basil® 4600 Cage and Rack Washer** and **Basil® 4602 Cage and Rack Washer** allow adjustment of previously programmed cycles to process different types of loads. All program changes are made using program touch pads on washer control panel (see Figure 5-1).

Program touch pads function as follows:

- **CHANGE VALUES touch pad** – press to access Change Values mode.
- **CURSOR (left or right) touch pad** – press until item to be changed (word, letter, or number) flashes.
- **VALUE (up or down) touch pad** – depending on item flashing (selected), press to either toggle between answer selections or scroll through alphabet and numbers 0 through 9.  
*NOTE: Alphabet includes characters for an underline ( \_ ) and a space ( ).*
- **SAVE VALUES touch pad** – press to save changes made, exit Change Values mode and return screen to cycle menu.

## 5.2 Change Values Mode

Change Values mode allows authorized operators to change both cycle values and general operating values. In Change Values mode, cycles may be altered and saved as custom cycle programs to meet specific washing needs. See **Table 5-1, CYCLE DESCRIPTION CHART**, for programmable values accessible through Change Values mode.

Table 5-1. Cycle Description Chart

PHASE:	PRE-WASH		ALKALINE WASH		ACID WASH		ACID SOAK		RINSE 1		RINSE 2		FINAL RINSE		EXHAUST	
	RECIROULATED	SELECT	RECIROULATED	SELECT	RECIROULATED	SELECT	RECIROULATED	SELECT	RECIROULATED	SELECT	RECIROULATED	SELECT	RECIROULATED	SELECT	RECIROULATED	SELECT
CIRCULATION (1) TIME:	DEFAULT 01:00	SELECT 00:00 TO 03:00	DEFAULT 05:00	SELECT 00:00 TO 04:30	DEFAULT 05:00	SELECT 00:00 TO 04:30	DEFAULT 01:30	SELECT 00:00 TO 04:30	DEFAULT 01:30	SELECT 00:00 TO 04:30	DEFAULT 01:30	SELECT 00:00 TO 04:30	DEFAULT 01:30	SELECT 00:00 TO 04:30	DEFAULT 01:30	SELECT 00:00 TO 04:30
INJECTION PUMP SELECTION:			ALKALINE DETERGENT PUMP		ACID DETERGENT PUMP											
WATER TYPE OR AIR TEMP	HTW		HEATED 140.0°F (60°C)	HEATED 170.0°F (22.0°C) TO 180.0°F (66.0°C)	HEATED 140.0°F (60°C)	HEATED 170.0°F (22.0°C) TO 180.0°F (66.0°C)	HEATED 190.0°F (82.2°C)	HEATED 170.0°F (22.0°C) TO 180.0°F (66.0°C)	HEATED 190.0°F (82.2°C)	HEATED 170.0°F (22.0°C) TO 180.0°F (66.0°C)	HEATED 190.0°F (82.2°C)	HEATED 170.0°F (22.0°C) TO 180.0°F (66.0°C)	HEATED 190.0°F (82.2°C)	HEATED 170.0°F (22.0°C) TO 180.0°F (66.0°C)		

CYCLE 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYCLE 12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

DEFAULT VALUES NOT SHOWN ON CHART ADJUSTABLE IN SERVICE MODE ONLY

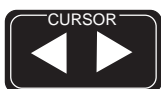
SUMP FILT. ALARM TIME:	05:00	DETERGENT MONITORING	03:00	NUMBER OF CHEMICAL PUMPS	3
SUMP DRAIN ALARM TIME:	00:01:59:99 01:00	PH MONITORING LIMITS	LOW	COMPLETE CYCLE ALARM TIME	02 TO 04 01:00
SUMP HEATING ALARM:	00:01:59:99 10:00	PH MONITORING LIMITS	LOW		
	00:01:45:00	PH MONITORING LIMITS	LOW		
ALKALINE NEUTRALIZER	INJECT:	PH MIXING TIME	HIGH		
	00:02:59:99 00:05	PH MIXING TIME	HIGH		
	00:01:59:99 00:45	PH MIXING TIME	HIGH		
CTW= COLD TAP WATER	WAIT:	PH NUMBER OF TRIES	9		
HTW= HOT TAP WATER	INJECT:	PH CONTAINMENT IN TIME	00:02		
	00:02:59:99 00:10	PH CONTAINMENT IN TIME	00:02		
	00:01:59:99 00:45	PH CONTAINMENT IN TIME	00:02		

X RECOMMENDED  
NOT APPLICABLE  
VALUES ADJUSTABLE BY THE  
OPERATOR IN AUTOMATIC MODE  
CTW= COLD TAP WATER  
HTW= HOT TAP WATER

RESERVE IN 100 DAYS  
RESERVE IN 1000 CYCLES  
CYCLE COUNT: 00000001 (TYPICAL)

REVISION: 0 (0005-1-23)  
REF.: #820-506-384-320

## 5.3 Programming Cycle Values



1. Set POWER-OFF/STANDBY switch, located behind printer door, to POWER. Unit name temporarily appears on screen then display shows first cycle menu:

**CYCLE 1**                      **CYCLE 2**  
**CYCLE 3**                      **CYCLE 4**

\_\_\_ indicates flashing position.

2. Press **CYCLE MENU** touch pad until desired cycle menu appears on screen. Display shows:

**CYCLE 9**                      **CYCLE 10**  
**CYCLE 11**                      **CYCLE 12**

\_\_\_ indicates flashing position.

3. Press **SELECT CYCLE** touch pad until desired cycle name flashes. Display shows:

**CYCLE 9**                      **CYCLE 10**  
**CYCLE 11**                      **CYCLE 12**

\_\_\_ indicates flashing position.

4. When desired cycle name is flashing, press **CHANGE VALUES** touch pad to access Change Values mode. Printer records:

\* CHANGE VALUE    8:44:51A

And first Change Values screen appears:

**CHANGE CYCLE NAME**  
**CYCLE 10**

\_\_\_ indicates flashing position.

**NOTE:** For Change Values mode, note the following:

1) If Access Code feature is enabled and the selected cycle is locked out, the Access Code sequence appears after **CHANGE VALUES** is pressed.

2) Change Values mode may be exited at any time by pressing **SAVE VALUES**. Control saves changed values and returns screen to selected cycle menu.

To change cycle name, press **CURSOR** (left or right) touch pad to advance flashing position one space at a time. Press **VALUE** (up or down) touch pad to select desired letter, number, punctuation or space. Cycle name can be a maximum of nine characters including spaces.

**NOTE:** Pressing **CURSOR** touch pad or **VALUE** touch pad repeatedly in one direction cycles through all available positions or letters and numbers.

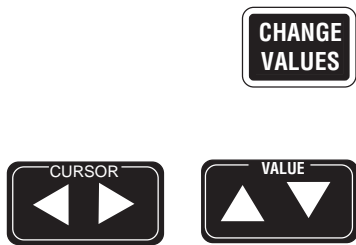
5. Press **CHANGE VALUES** touch pad. Bottle Washing option screen appears:

**BOTTLE WASHING**  
**NO**

\_\_\_ indicates flashing position.

6. Press **VALUE (up or down)** touch pad to toggle between YES and NO. Selecting NO disables bottle wash option. Selecting YES enables bottle wash option.

### 5.3.1 Pre-Wash



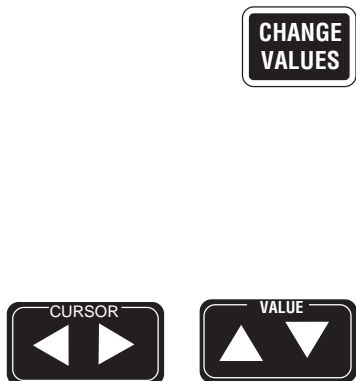
1. Press **CHANGE VALUES** touch pad. Pre-Wash screen appears:

**CYCLE 10**                      **HTW**  
**PRE-WASH**                      **T=MM:SS**

\_\_\_ indicates flashing position.

2. To enter Pre-Wash phase time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.

### 5.3.2 Alkaline Wash



1. Press **CHANGE VALUES** touch pad. Alkaline Wash phase values screen appears:

**CYCLE 10**                      **SP=140.0F**  
**ALK.WASH**                      **T=MM:SS**

\_\_\_ indicates flashing position.

*NOTE: If treatment time is set to 0, treatment is bypassed and question is not displayed.*

2. To enter Wash temperature setpoint and phase time, press **CURSOR (left or right)** to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Temperature setpoint is input as any number value to 1/10 of a degree, between 70 and 185°F (22 and 85°C). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.

3. Press **CHANGE VALUES**. Alkaline wash Temperature Guarantee option screen appears:

**GUAR. ALK.WAS TEMP?**  
**NO**

\_\_\_ indicates flashing position.

4. Press **VALUE (up or down)** touch pad to toggle between YES or NO answer. Selecting NO starts Wash phase time countdown at beginning of phase. Selecting YES guarantees that Wash phase time counts down only when solution temperature is equal to or greater than programmed set point.

*NOTE: With Temperature Guarantee feature enabled, phase time does not count down unless setpoint is reached. It is important that setpoint be an attainable value. Guaranteed temperature is shown by a G before setpoint (GSP instead of SP). Wash chamber returned to drain is shown by an R before setpoint (RGSP or RSP).*



5. Press **CHANGE VALUES** touch pad. If option applies, display shows Conductivity Option screen:

**SELECT CONCENTRATION**  
**1/4 OZ**

       indicates flashing position.



6. Press **VALUE** (up or down) touch pad to scroll available concentrations (1/4, 1/2, 1, 2 oz and default concentration name).



7. Press **CHANGE VALUES** touch pad. If option applies, display shows Time-based Alkaline Neutralization Option screen:

**CYCLE 10**  
**ACID INJ.                      T=MM:SS**

       indicates flashing position.

*NOTE: If water is saved, Return to Alkaline Tank question is not displayed. To enter alkaline neutralizer injection time, press **CURSOR** touch pad to select position and **VALUE** touch pad to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99 minutes and 0-99 seconds.*



8. Press **CHANGE VALUES** touch pad. Display shows Alkaline wash water reuse option:

**SAVE ALK. WASH WATER**  
**YES**

       indicates flashing position.



9. Press **VALUE** (up or down) touch pad to toggle between YES and NO answer. Selecting NO deactivates Alkaline wash water reuse option. Selecting YES activates Alkaline wash water reuse option, so that at end of treatment, water is sent back to Alkaline tank.

### 5.3.3 Acid Wash



1. Press **CHANGE VALUES** touch pad. Acid wash phase values screen appears:

**CYCLE 10**                      **SP=140.0F**  
**ACID WASH**                      **T=MM:SS**

       indicates flashing position.

*NOTE: If treatment time is set to 0, treatment is bypassed and question is not displayed.*



2. To enter Wash temperature setpoint and phase time, press **CURSOR** (left or right) touch pad to select position and **VALUE** (up or down) touch pad to select desired number (0-9). Temperature setpoint is input as any number value to 1/10 of a degree, between 70 and 185°F (22 and 85°C). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.



- Press **CHANGES VALUES** touch pad. Wash Temperature Guarantee option screen appears:

**GUAR.ACID WASH TEMP?**  
**NO**

       indicates flashing position.



- Press **VALUE (up or down)** touch pad to toggle between YES or NO answer. Selecting NO starts Wash phase time countdown at beginning of phase. Selecting YES guarantees that Wash phase time counts down only when solution temperature is equal to or greater than programmed setpoint.

*NOTE: With Temperature Guaranteed feature enabled, phase time does not count down unless setpoint is reached. It is important that setpoint be an attainable value. Guaranteed temperature is shown by a G before setpoint (GSP instead of SP). Wash water returned to tank is shown by an R before setpoint (RGSP or RSP).*



- Press **CHANGES VALUES**. Display shows Conductivity Option Screen (if option applies):

**SELECT CONCENTRATION**  
**1/4 oz**

       indicates flashing position.



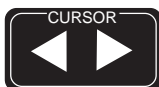
- Press **VALUE (up or down)** touch pad to scroll available concentrations (1/4, 1/2, 1, and 2 oz).



- Press **CHANGE VALUES** touch pad. Display shows Time-based Acid detergent screen, if unit is provided with a time-based acid detergent setting:

**CYCLE 10**  
**ACID INJ.                      T=MM:SS**

       indicates flashing position.



- To enter acid detergent injection time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99 minutes and 0-99 seconds.



- Press **CHANGE VALUES** touch pad. Display shows Time-based Acid Neutralization Option (if option applies):

**CYCLE 10**  
**ACID NEUT.                      T=MM:SS**

       indicates flashing position.

*NOTE: If water is saved (returned to Acid tank option), question is not displayed.*



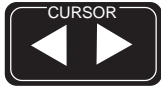
- To enter acid neutralizer injection time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99 minutes and 0-99 seconds.



11. Press **CHANGE VALUES** touch pad. Display shows Acid Soak screen:

**CYCLE 1**  
**ACID SOAK**      **T=MM:SS**

       indicates flashing position.



12. To enter acid soaking time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99 minutes and 0-99 seconds.



13. Press **CHANGE VALUES** touch pad. If option applies, display shows Acid Wash Water Reuse option:

**SAVE ACID WASH WATER**  
**YES**

       indicates flashing position.

*NOTE: Question is displayed only if Acid tank option is present on unit.*



14. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Selecting NO deactivates Acid wash water reuse option. Selecting YES activates Acid wash water reuse option, so that at end of treatment, water is sent back to Acid tank (option).

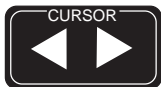
### 5.3.4 Rinse



1. Press **CHANGE VALUES** touch pad. Rinse 1 phase values screen appears:

**CYCLE 10**      **SP=180.0F**  
**Rinse 1**      **T= 01: 30**

       indicates flashing position.



2. To enter First Rinse temperature setpoint and phase time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Temperature setpoint is input as any number value to 1/10 of a degree. Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds. Temperature is adjustable from 70 to 185 °F (22 to 85°C).



3. Press **CHANGE VALUES** touch pad. Rinse 1 Temperature Guarantee option screen appears:

**GUAR. RINSE 1 TEMP.**  
**NO**

       indicates flashing position.



4. Press **VALUE (up or down)** touch pad to toggle between YES or NO answer. Selecting NO starts First Rinse phase time count-down at beginning of phase. Selecting YES guarantees that First Rinse phase time counts down only when water temperature is equal to or greater than programmed setpoint.

**NOTE:** With Temperature Guarantee feature enabled, phase time does not count down unless setpoint is reached. It is important that setpoint be an attainable value. Guaranteed temperature is shown by a G before set point (GSP instead of SP).



5. Press **CHANGE VALUES** touch pad. Rinse 2 phase values screen appears:

**CYCLE 10**                      **SP=180.0F**  
**RINSE 2**                      **T= 01:30**

\_\_ indicates flashing position.



6. To enter Rinse 2 temperature setpoint and phase time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Temperature setpoint is input as any number value to 1/10 of a degree. Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds. Temperature is adjustable from 70 to 185°F (22 to 85°C).



7. Press **CHANGE VALUES** touch pad. Rinse 2 Temperature Guarantee option screen appears:

**GUAR. RINSE 2 TEMP?**  
**NO**

\_\_ indicates flashing position.



8. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Selecting NO starts Second Rinse phase time countdown at beginning of phase. Selecting YES guarantees that Second Rinse phase time counts down only when water temperature is equal to or greater than programmed setpoint.

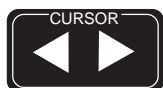
**NOTE:** With Temperature Guarantee feature enabled, phase time does not count down unless setpoint is reached. It is important that setpoint be an attainable value. Guaranteed temperature is shown by a G before set point (GSP instead of SP).



9. Press **CHANGE VALUES** touch pad Final Rinse phase values screen appears:

**CYCLE 10**                      **SP=180.0F**  
**F. RINSE**                      **T=MM.SS**

\_\_ indicates flashing position.



10. To enter Final Rinse temperature setpoint and phase time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Temperature setpoint is input as any number value to 1/10 of a degree. Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds. Temperature is adjustable from 70 to 185°F (22 to 85°C).



11. Press **CHANGE VALUES** touch pad. Recirculated Final Rinse screen appears:

**RECIR. FINAL RINSE**  
**NO**

\_\_ indicates flashing position.

*NOTE: This display is only shown if non-recirculated final rinse is available.*



12. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Selecting NO means that final rinse is non-recirculated. Selecting YES means that final rinse is recirculated.

13. Press **CHANGE VALUES** touch pad. Final Rinse Temperature Guarantee option screen appears (only if final rinse is recirculated):

**GUAR.F.RINSE TEMP.**  
**NO**

*\_\_ indicates flashing position.*



14. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Selecting NO starts Final Rinse phase time countdown at beginning of phase. Selecting YES guarantees that Final Rinse phase time counts down only when water temperature is equal to or greater than programmed set point.

*NOTE: With Temperature Guarantee feature enabled, phase time does not count down unless setpoint is reached. It is important that set point be an attainable value. Guaranteed temperature is shown by a G before setpoint (GSP instead of SP).*



15. Press **CHANGE VALUES** touch pad. The following message screen appears:

**REUSE F. RINSE WATER?**  
**NO**

*\_\_ indicates flashing position.*

*NOTE: This question is not displayed if all three rinses are bypassed. Water is reused, if final rinse is non-recirculated.*



16. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Selecting YES retains rinse water in sump at end of Final Rinse phase. Selecting NO pumps rinse water to drain.



17. Press **CHANGE VALUES** touch pad. Exhaust Phase Values screen appears:

**CYCLE 10**  
**EXHAUST** **T=MM:SS**

*\_\_ indicates flashing position.*



18. To enter Exhaust phase time, press **CURSOR (left or right)** touch pad to select position and **VALUE (up or down)** touch pad to select desired number (0-9). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.



19. Press **CHANGE VALUES** touch pad. Print Cycle Values option screen appears:

**PRINT CYCLE VALUES?**  
**NO**

*\_\_ indicates flashing position.*



*NOTE: Display is shown only if printer is enabled.*

20. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Selecting YES generates a printout of cycle phase values once Save Values or Change Values is pressed.
21. At this point, operator has option to either continue in Change Values mode or save values and exit Change Values mode. To continue in Change Values mode, press **CHANGE VALUES** touch pad. Change Operating Values option screen appears:

**CHANGE MISCELLANEOUS  
VALUES?                      NO**

*\_\_ indicates flashing position.*

*NOTE: See SECTION 5.4, PROGRAMMING OPERATING VALUES, for details on continuing in Change Values mode.*

## 5.4 Programming Operating Values

1. Set POWER-OFF/STANDBY, located behind printer door, to POWER. Unit name temporarily appears on screen then screen displays first cycle menu:

**CYCLE 1                      CYCLE 2  
CYCLE 3                      CYCLE 4**

*\_\_ indicates flashing position.*

2. Press **CHANGE VALUES** touch pad to access Change Values mode.

*NOTE: Access to operating values may be made through any cycle.*

First Change Values screen appears:

**CHANGE CYCLE NAME  
CYCLE 1**

*\_\_ indicates flashing position.*

*NOTE: Change Values mode may be exited at any time by pressing Save Values. Control saves changed values and return screen to selected cycle menu.*

3. Press **CHANGE VALUES** touch pad several times to advance through phase values screens until Change Miscellaneous Values option screen appears:

**CHANGE MISCELLANEOUS  
VALUES?                      NO**

*\_\_ indicates flashing position.*

4. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Select YES to continue in Change Values mode.

*NOTE: If NO is selected, pressing Change Values or Save Values returns display screen to cycle menu.*





5. Press **CHANGE VALUES** touch pad. Printer enabling screen appears:

**PRINTER ENABLED?**  
**NO**

       indicates flashing position.



6. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. Select YES to enable printer, NO to disable it.

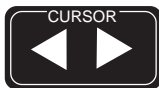


7. Press **CHANGE VALUES** touch pad. Date and Time screen appears:

**DATE**  
**TIME**

**MM/DD/YY**  
**HH:MM:SSA**

       indicates flashing position.



8. To enter correct date and time, press **CURSOR (left or right)** touch pad to advance flashing position one space at a time. Press **VALUE (up or down)** touch pad to select desired number (0-9). Date is input as two-digit numerical values for Month/Day/Year. Time is input as Hour/Minute/Second.

*NOTE: When setting the date and time, note the following:*

*1) Pressing CURSOR touch pad or VALUE touch pad repeatedly in one direction cycles through all available positions or letters and numbers.*

*2) If Access Code feature is enabled and selected cycle is not locked out, Access Code sequence appear after Date and Time screen (see SECTION 5.5, PROGRAMMING VALUES WITH ACCESS CODE ENABLED).*



9. Press **SAVE VALUES** touch pad to save miscellaneous value, exit Change Values mode and return screen to cycle menu.

*NOTE: At this point, pressing Change Values also saves all changed operating values, exit Change Values mode and return screen to cycle menu.*

## 5.5 Programming Values with Access Code Enabled

Access code feature is used to prevent unauthorized changes to parameters of designated cycles and/or operating values by unauthorized operators. With this feature, access to cycle values may be selectively limited to authorized operators only, depending on security needs of washer environment. When access code is enabled, only authorized operators can change operating values.

### ADVANTAGES OF ENABLING OR DISABLING ACCESS CODE:

Enabling or disabling access code can impact efficiency of washing operations. For that reason, supervisor should carefully consider choices: if access code is **ON**, supervisor can ensure operators use washer within predetermined parameters; if access code is **OFF**, supervisor can allow operators more flexibility in determining which cycles to use and how to use them. Deciding factor should be what works best for facility's operation.



1. When desired cycle name is flashing, press **CHANGE VALUES** touch pad to access Change Values mode. Printer records:

\* CHANGE VALUE3:51:17P

and, if selected cycle is locked out, display shows:

**DO YOU KNOW ACCESS  
CODE? NO**

           indicates flashing position.



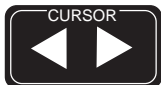
2. Press **VALUE (up or down)** touch pad to toggle between YES and NO answer. If NO is selected, screen returns to cycle menu once Change Values is pressed.



3. Press **CHANGE VALUES** touch pad. If YES was selected, display shows:

**ENTER ACCESS CODE  
CODE = 0000**

           indicates flashing position.



4. To enter access code, press **CURSOR (left or right)** touch pad to advance flashing position one space at a time. Press **VALUE (up or down)** touch pad to select desired number (0-9). Access code is input as a four digit number from 0001 to 9999. If an incorrect access code is entered, screen returns to cycle menu once **CHANGE VALUES** touch pad is pressed.

*NOTE: Pressing CURSOR touch pad or VALUES touch pad repeatedly in one direction cycles through all available positions or letters and numbers.*



5. Press **CHANGE VALUES** touch pad. Display shows First Change Values message:

**CHANGE CYCLE NAME  
CYCLE 1**

           indicates flashing position.

At this point, operator has access to all phase value screens of selected cycle and operating values screens. Sequence and procedures for changing cycle phase and operating values are same as previously discussed.

*NOTE: If Access Code feature is enabled and selected cycle is not locked out, only operating values are protected by access code. Access code screen sequence occurs after "Date and Time" screen. After entering correct access code, operator has access to remaining operating values screens.*

## 6.1 General



### **WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:**

- Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described within this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.
- Only STERIS or STERIS-trained service personnel should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding Service options.



**WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:** Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.



**WARNING – BURN HAZARD:** Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

Procedures described in this section must be performed at regular intervals as indicated. Indicated frequencies are minimums and should be increased with increased usage of equipment. If a problem occurs, refer to *SECTION 7, TROUBLESHOOTING*.

A sample preventive maintenance schedule is included in this section. Use sample schedule as a guide to establish a facility preventive maintenance record for your washer.

## 6.2 Preventive Maintenance Schedule

It is important, for proper and efficient operation of washer, to set up a schedule of periodic inspection and maintenance following established institutional practices. Close attention should be paid to conditions in operating environment which will affect frequency of some maintenance procedures indicated (e.g., mineral content of water supply, washer usage).

The following schedule should be used as a guide to properly maintain washer. These procedures should be carried out only by qualified service technicians. Contact STERIS when service is required.

**Table 6-1. Preventive Maintenance Schedule**

Recommended frequency of inspection is monthly. Usage, utility conditions may require more or less frequent inspections. Tasks are defined on a yearly basis,		Min. Frequency
<b>1.0</b>	<b>PREPARATION FOR PREVENTIVE MAINTENANCE</b>	
1.1	Discuss equipment operation with department personnel.	6 x/yr
1.2	Inspect printouts for signs of trouble.	6 x/yr
1.3	If required, install test equipment.	A/R
1.4	Before servicing equipment, use Lockout-Tagout practices. Always follow local occupational health and safety regulations as well as electric and plumbing codes	every inspection
1.5	When necessary, shut off all building services and drain all lines.	A/R
1.6	Verify equipment disconnect device is within easy reach and accessible to operator at all times.	every inspection
<b>2.0</b>	<b>STAGE IV CONTROL</b>	
2.1	Inspect printout for proper operation of printer.	6 x/yr
2.2	Verify paper take-up is working properly.	6 x/yr
2.3	Verify printout for darkness, missing dots, etc.	6 x/yr
<b>3.0</b>	<b>DOOR ASSEMBLY (EACH DOOR)</b>	
3.1	Inspect door for ease of operation.	6 x/yr
3.2	Verify operation of door safety switch. Adjust if necessary.	2 x/yr
3.3	Verify operation of interlock system. Adjust if necessary.	2 x/yr
3.4	Inspect condition of door gasket for wear. Replace if necessary.	1 x/yr
<b>4.0</b>	<b>CHAMBER COMPONENTS</b>	
4.1	Verify sump under floor sections for debris. Use a hose to clean if necessary.	6 x/yr
4.2	Remove hard water deposits from sump, chamber interior, and accessories.	12 x/yr
4.3	Inspect condition of water level. Clean if necessary.	12 x/yr
4.4	Verify condition of washer accessories.	6 x/yr

*\*Contact STERIS for this service. Preventive Maintenance is not covered under warranty.*

**Table 6-1. Preventive Maintenance Schedule (Cont'd)**


Recommended frequency of inspection is monthly. Usage, utility conditions may require more or less frequent inspections. Tasks are defined on a yearly basis,		Min. Frequency
<b>4.0 CHAMBER COMPONENTS (Cont'd)</b>		
4.5	Verify interior light. Replace if necessary.	6 x/yr
4.6	Check piping system for leaks. Repair if necessary.*	6 x/yr
4.7	Verify pump suction strainer for debris. Clean if necessary.	6 x/yr
4.8	If option is present, verify connections between riser valve and bottle washing cart is secure.	3 x/yr
<b>5.0 OSCILLATING JET SYSTEM</b>		
5.1	Inspect spray jets. Align and clean if necessary.	1 x/wk
5.2	Inspect spray headers. Flush out if necessary.	1 x/wk
5.3	Inspect oscillating carriage drive and clutch system. Test clutch for slippage. Adjust if necessary.*	6 x/yr
5.4	Verify drive cable rollers for wear. Replace if necessary.*	6 x/yr
<b>6.0 EACH SUPPLY-LINE STRAINER*</b>		
6.1	Inspect supply-line strainers for debris. Clean as necessary.	6 x/yr
<b>7.0 EACH STEAM TRAP</b>		
7.1	Inspect steam trap for proper operation.	6 x/yr
<b>8.0 AUTOMATIC DETERGENT INJECTION SYSTEM</b>		
8.1	Inspect and lubricate detergent supply and injection hose. Replace if necessary.	6 x/yr
8.2	Lubricate chemical injection pump rollers.	12 x/yr
8.3	Verify pickup tubes screen for debris. Clean as necessary.*	6 x/yr
8.4	Verify amount of detergent injected.	3 x/yr
<b>9.0 OPTIONAL EXHAUST FAN</b>		
9.1	Grease fan bearings in two locations.	1 x/wk
<b>10.0 SAFETY FEATURES</b>		
10.1	Verify warning plates inside wash chamber for legibility. If worn out, broken, or no longer legible, replace with new ones.	3 x/yr
10.2	Test Emergency Stop cables for proper operation.	6 x/yr
<b>11.0 FINAL TEST</b>		
11.1	Clean lint and dirt from components.	every inspection


*\*Contact STERIS for this service. Preventive Maintenance is not covered under warranty.*


**Table 6-1. Preventive Maintenance Schedule (Cont'd)**

Recommended frequency of inspection is monthly. Usage, utility conditions may require more or less frequent inspections. Tasks are defined on a yearly basis,		Min. Frequency
<b>11.0 FINAL TEST (Cont'd)</b>		
11.2	Verify work area to ensure removal of all material used during inspection.	every inspection
11.3	Install any panel or cover removed during inspection.	every inspection
11.4	Unlock electrical disconnect switch to ON, and turn all utilities back ON.	every inspection


### 6.3 Daily Cleaning Procedures

 **WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:** Always wear appropriate Personal Protective Equipment (PPE) when cleaning or removing debris from bottom of wash chamber and over suction plate.

 **WARNING – PERSONAL INJURY HAZARD:** Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed, contaminated debris or water may remain in the bottom of the wash chamber.


 **WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:** Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.


1. After last cycle of day, allow unit to cool, close steam, hot and cold water lines; then, wearing appropriate Personal Protective Equipment (PPE) enter wash chamber and remove and clean suction pump strainer as follows:
  - a. Remove floor gratings in wash chamber.
  - b. Loosen hose clamps and pull strainer straight out.
  - c. Rinse strainer under a forceful stream of water to remove all soil and debris. Always clean filters while still wet before foreign matter dries.
  - d. Replace suction pump strainer in chamber sump and tighten hose clamps.
2. Remove riser valve and inspect for debris. Brush off and rinse under tap water if necessary.
3. Open steam, hot and cold water lines.

 **WARNING – BURN HAZARD:** Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

## 6.4 Weekly Cleaning Procedures

### 6.4.1 Clean Washer Exterior


 **WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:** Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

 **CAUTION POSSIBLE EQUIPMENT DAMAGE:** Use non-abrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion applied with a wire brush or steel wool will scratch and dull stainless steel. Do not use these cleaners on painted surfaces.

Clean washer exterior with a general purpose cleaner to remove general stains, a stainless-steel stain remover for stubborn stains, and a stainless-steel polish to keep equipment looking new.

1. Using a damp cloth or sponge, apply cleaner in a back-and-forth motion, in same direction as surface grain.
2. Thoroughly wipe off cleaner.
3. Polish surface with a clean, dry and lint-free cloth.
4. Clean door windows with a general window cleaning product.
5. Dry window with a lint-free cloth.

### 6.4.2 Clean Washer Interior

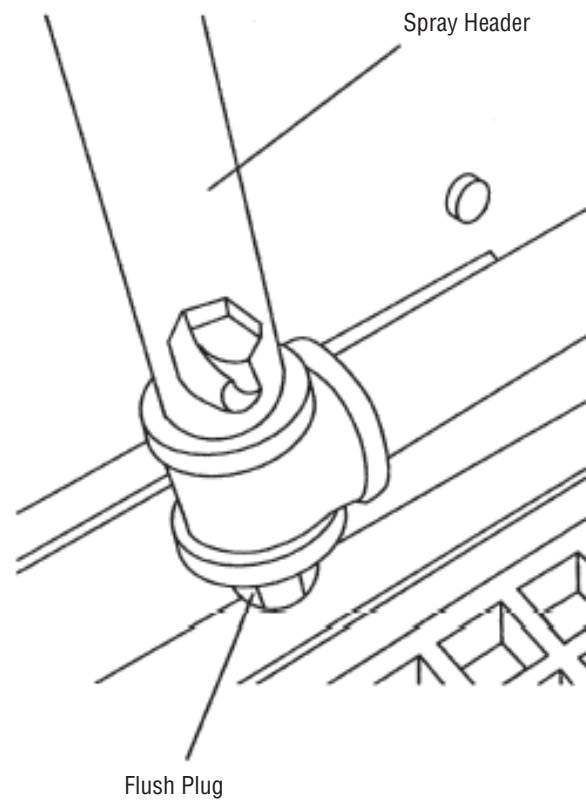
 **WARNING – BURN HAZARD:** Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed, contaminated debris or water may remain in the bottom of the wash chamber.

Close steam, hot and cold water lines and wearing appropriate Personal Protective Equipment (PPE), enter wash chamber and proceed as follows:

1. Wash chamber with a mild detergent solution.
2. Rinse with tap water and dry with a lint-free cloth.
3. If interior is stained, use a general purpose cleaner to remove general stains or a stainless-steel remover for stubborn stains, as follows:
  - a. Using a damp cloth or sponge, apply cleaner in a back-and-forth motion, in same direction as surface grain.
  - b. Thoroughly wipe off cleaner.
  - c. Polish surface with a clean, dry, lint-free cloth.
  - d. Clean door windows with a general window cleaning product.
  - e. Dry window with a lint-free cloth.
4. Open steam, hot and cold water lines.

### 6.4.3 Clean Spray Jets and Headers

1. Observe jet nozzles during unit operation and inspect each nozzle to detect debris.
2. Insert a wire (smaller diameter than a jet nozzle) into spray nozzles, and push debris through nozzles into header.
3. Remove flush plug from bottom of each spray header (see Figure 6-1).
4. Manually fill sump with water and run pump for 30 seconds to flush loosened debris from spray headers.
5. Replace flush plugs.



**Figure 6-1. Spray Header Flush Plug**

#### 6.4.4 Inspect Self-Cleaning Screen

**⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:** Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

**⚠ WARNING – BURN HAZARD:**

- Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.
- Pipes may be extremely hot.

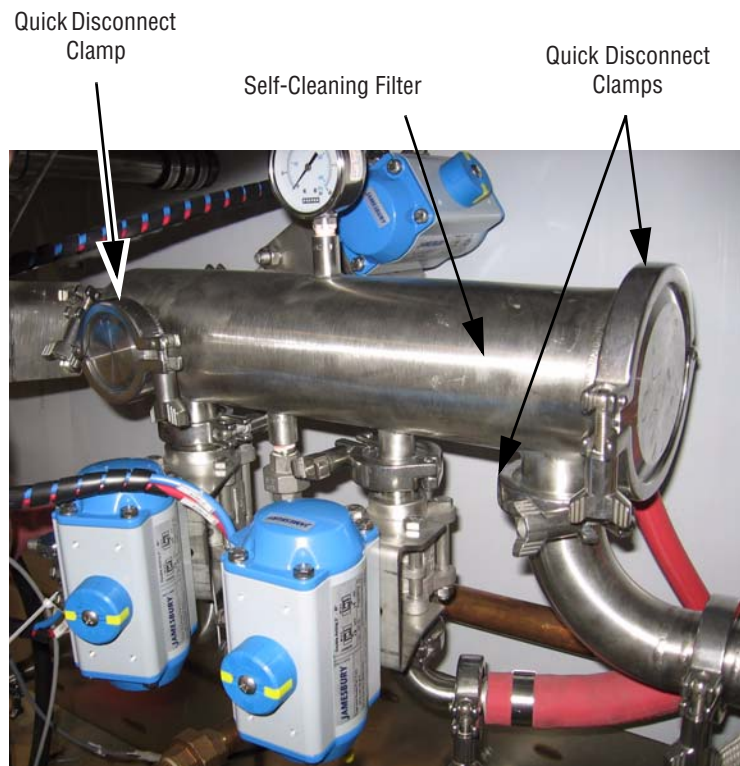
*NOTE: A STERIS or STERIS-trained service technician is required to perform this task. Contact STERIS for this service. Preventive maintenance is not covered under warranty.*

**IMPORTANT:** Intake filter requires periodic inspection and replacement. Initial inspection is suggested once a week; user should determine frequency thereafter.

1. Set POWER-OFF/STANDBY switch to OFF/STANDBY. Lock disconnect switch in OFF position and close building supply valves.
2. Allow unit to cool down.
3. Remove quick disconnect clamps located directly on filter assembly (see Figure 6-2).
4. Remove filter cartridge by pulling straight out on handle.
5. Brush and rinse surface of filter cartridge to remove any debris. Inspect O-ring for damage.
6. Rinse filter under running water.
7. Reinsert filter cartridge. Reposition gaskets, quick disconnect clamps, and tighten.

*NOTE: Gasket should last for several inspection procedures. When necessary, order replacement gasket (P117951-568 and P117951-392) from STERIS.*

8. Re-energize washer utilities.



**Figure 6-2. Self-Cleaning Screen**

## 6.5 Monthly Cleaning Procedures

### 6.5.1 Remove Hard Water Deposits From Chamber and Accessories



**WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:** Wear gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If spilled or splashed, flush with plenty of water for 15 minutes. If swallowed, **DO NOT** induce vomiting. Administer an alkali with plenty of water. Seek medical attention immediately.



**WARNING – SLIPPING HAZARD:** To avoid slippery floor conditions, keep floor dry. Promptly wipe up any spilled liquids or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

*NOTE: Depending on hardness of water being used, it may be necessary to remove hard water deposits more often. Remove deposits from chamber and material handling accessories whenever deposits become visible.*

1. Open chamber door. If desired, place empty wash cart(s) and accessories in chamber.
2. Turn OFF detergent supply pump (optional or by others).
3. Pour 1 gal (3.8 L) of descaling liquid into chamber sump. Exit chamber and close door.
4. Press **MANUAL MENU** touch pad to access Manual Control mode.
5. Select and start Pump/Drive function.
6. Let washer run for 15 minutes, then press **STOP/RESET** touch pad.
7. Once hard water deposits are removed, select and start Drain function to drain descaler solution from sump.
8. Manually fill and drain chamber sump again to remove any residue.
9. Press **STOP/RESET** touch pad to exit Manual Control mode and turn ON detergent pump.

## 6.6 Routine Maintenance

### 6.6.1 Grease Exhaust Fan Bearings

**⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:** Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

**⚠ WARNING – BURN HAZARD:** Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

Exhaust fan bearings must be greased once a week as follows:

1. Locate remote exhaust fan grease fittings (see Figure 6-3).
2. Apply a high temperature, water-resistant grease (P117951-457).

*NOTE: If a standard temperature grease is used, fan bearings must be greased once at end of each day.*



**Figure 6-3. Exhaust Fan Grease Fittings**

### 6.6.2 Clean Drain Discharge Side Tank

Side tanks must be cleaned once every two months as follows:

1. Lock disconnect switch in OFF position and close building supply valves.
2. Open manual drain valve (see Figure 6-4). Allow any remaining liquids to drain.
3. Lift off tank cover and flush out tank by spraying inside of tank with hose. Allow tank to drain and replace tank cover.
4. Close drain valve.
5. Repeat procedure for each tank.
6. Re-energize washer utilities.

- **Side tank with guaranteed temperature (option):**

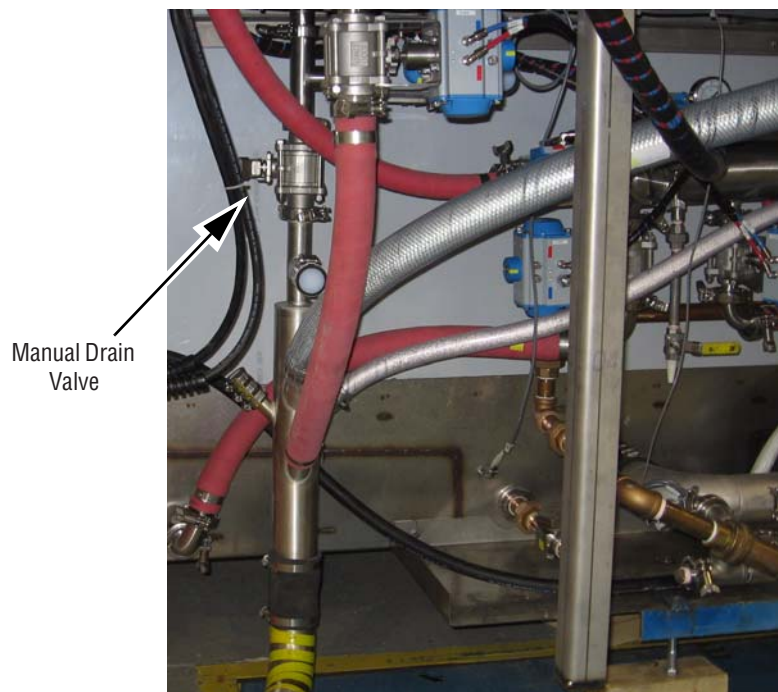
1. Partially drain side tank using Manual Control mode as follows:
  - a. Press **MANUAL MENU** touch pad to access Manual Control mode:

#### MANUAL CONTROL MENU

...and display menu of available manual functions:

<b>FILL</b>	<b>DRAIN</b>
<b>PUMP/DRV</b>	<b>DRIVE</b>

*\_\_ indicates flashing position.*



**Figure 6-4. Manual Drain Valve**

- b. Press **SELECT CYCLE** touch pad until DRAIN function is flashing.

**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.

- c. Press **CYCLE/START** touch pad to select DRAIN function. A menu screen appears listing chamber sump and other washer tanks which may be drained using this function.

**SUMP**                      **ALKTANK**  
**COOLDOWN**              **ACIDTANK**

\_\_\_ indicates flashing position.

- d. Press **SELECT CYCLE** touch pad until COOL DOWN tank is flashing.

**SUMP**                      **ALKTANK**  
**COOLDOWN**              **ACIDTANK**

\_\_\_ indicates flashing position.

- e. Press **CYCLE/START** touch pad to begin draining cool down (drain discharge) tank. Current washer status and operator instruction message appear on screen.

**COOLDOWN DRAINING...**  
**PRESS STOP TO ABORT**

2. Allow tank to partially drain, then position POWER-OFF/STANDBY switch to OFF/STANDBY, lock disconnect switch in OFF position and close building supply valves.
3. Lift off cover and flush out tank spraying inside of tank with hose.
4. Replace tank cover and re-energize washer utilities.
5. Position POWER-OFF/STANDBY switch to POWER and resume draining side tank.
6. When draining is complete, washer status message temporarily appears on screen.

**COOLDOWN TANK**  
**EMPTY**

... then screen returns to drain menu:

**SUMP**                      **ALKTANK**  
**COOLDOWN**              **ACIDTANK**

\_\_\_ indicates flashing position.


7. Press **STOP/RESET** touch pad to return screen to manual function menu.


**FILL**                      **DRAIN**  
**PUMP/DRV**              **DRIVE**

\_\_\_ indicates flashing position.


8. Press **STOP/RESET** touch pad to exit Manual Control mode.

### 6.6.3 Clean Drain Discharge Temperature Control Probe

 **WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:** Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

 **WARNING – BURN HAZARD:**

- Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.
- Pipes may be extremely hot.

 **WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:** Wear gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If spilled or splashed, flush with plenty of water for 15 minutes. If swallowed, DO NOT induce vomiting. Administer an alkali with plenty of water. Seek medical attention immediately.

Temperature control probe must be cleaned once every month as follows:

1. Drain discharge side tank using Manual Control mode.
2. Lock disconnect switch in OFF position and close building supply valves.
3. Locate temperature control probe along side of discharge tank.
4. Loosen compression fitting nut and remove probe from discharge tank.
5. Using a rag dampened with acid or descaler, remove hard water deposits and debris from probe.
6. Reinstall probe and tighten compression fitting nut.
7. Re-energize washer utilities.

### 6.6.4 Replace Detergent Squeeze Tube



#### **WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:**

- Washer chemicals are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow precautions and instructions on chemical label and in Material Safety Data Sheet (MSDS) prior to handling detergent containers, or servicing detergent injection pumps, tank, and lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling chemicals or servicing chemical injection pumps, tank, and lines.
- Wear appropriate Personal Protective Equipment (PPE) when removing clamps and replacing squeeze tubes. Residual chemicals might remain in used squeeze tubes. If chemical contacts skin or eyes, immediately flush with running water for at least 10 minutes. If contact was with eyes, seek medical attention.



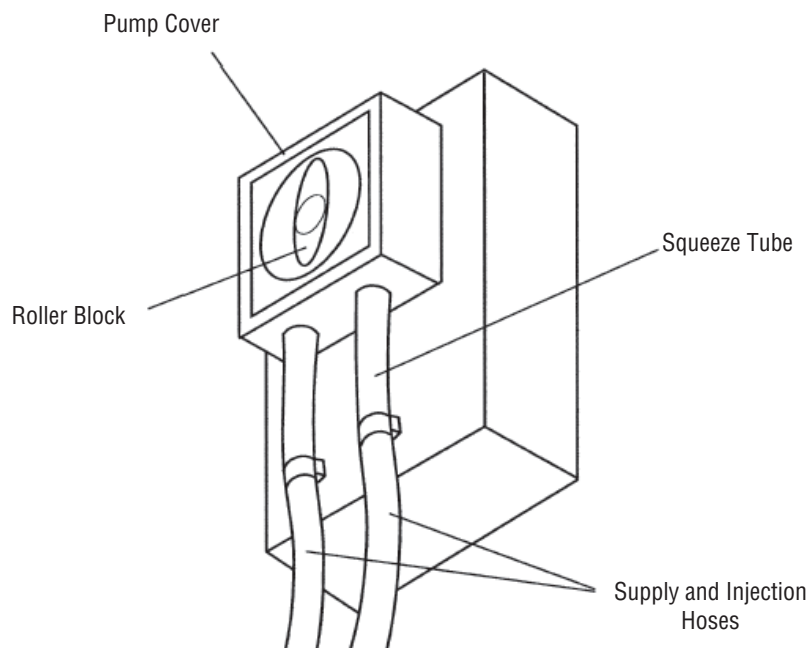
#### **CAUTION – POSSIBLE EQUIPMENT DAMAGE:**

Always use a silicone lubricant to lubricate squeeze tubes. Petroleum-based lubricants, such as Vaseline<sup>®1</sup> or grease, will cause squeeze tubes to melt.

<sup>1</sup> Vaseline is a trademark of Chesebrough-Pond's Incorporated

Replace detergent squeeze tube as follows:

1. Set POWER-OFF/STANDBY switch to OFF/STANDBY. Lock disconnect switch in OFF position and close building supply valves.
2. Locate detergent supply pump.
3. Remove clamps and disconnect supply and injection hoses from squeeze tube (see Figure 6-5).
4. Remove screws from pump cover and lift off pump cover.
5. Grasp one end of squeeze tube and pull tube out of pump. Discard tube.
6. Clean all pump surfaces.
7. Lubricate new squeeze tube (P177950-583). Liberally apply lubricant (P117950-599) over tube surface to within 2" [51 mm] of each end.
8. Insert one end of squeeze tube into pump. Feed tube through Pump by manually rotating roller block.
9. Spread lubricant over rollers in roller block.
10. Replace pump cover and fasten with screws previously removed.
11. Connect supply and injection hoses to ends of squeeze tube and attach clamps.
12. Re-energize washer utilities.



**Figure 6-5. Replace Squeeze Tube**

### 6.6.5 Replacing Detergent Container

⚠	<b>WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:</b> Washer chemicals are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow precautions and instructions on chemical label and in Material Safety Data Sheet (MSDS) prior to handling detergent containers, or servicing detergent injection pumps, tank, and lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling chemicals or servicing chemical injection pumps, tank, and lines.
⚠	<b>WARNING – SLIPPING HAZARD:</b> To avoid slippery floor conditions, keep floor dry. Promptly wipe up any spilled liquids or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).
⚠	<b>CAUTION – POSSIBLE EQUIPMENT DAMAGE:</b> <ul style="list-style-type: none"><li>• When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.</li><li>• Always use non-foaming chemical for effective cleaning and proper pump and water level control operation. Follow manufacturer's recommendations for amount of chemical to be used.</li></ul>

To achieve maximum cleaning efficiency, select a chemical appropriate to soil type being processed. Refer to *SECTION 2.3, CHEMICAL ADDITIVES SPECIFICATIONS*, and always follow chemical manufacturer's recommendations for amount of chemical to be used.

**NOTE:** Always use a non-foaming chemical for effective cleaning and proper pump operation.

When chemical is low or has run out:

1. Remove pickup tube and level sensor assembly from empty container and remove container.
2. Install a new container.
3. Insert pickup tube and level sensor vertically into new container.

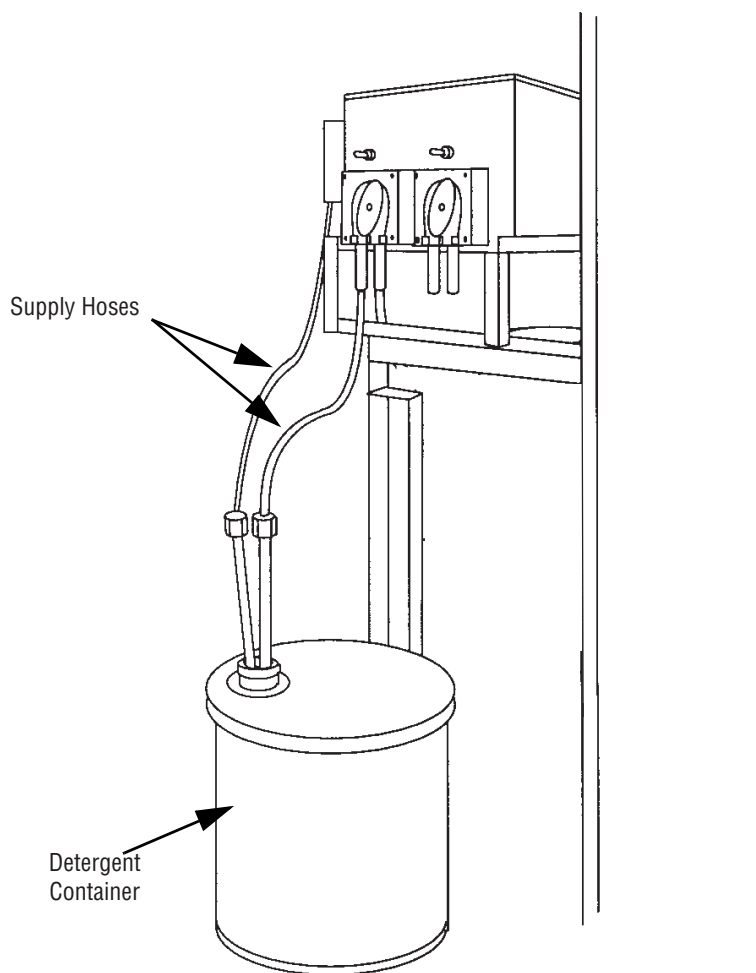


Figure 6-6. Replacing Detergent Container

## 6.7 Printer Paper

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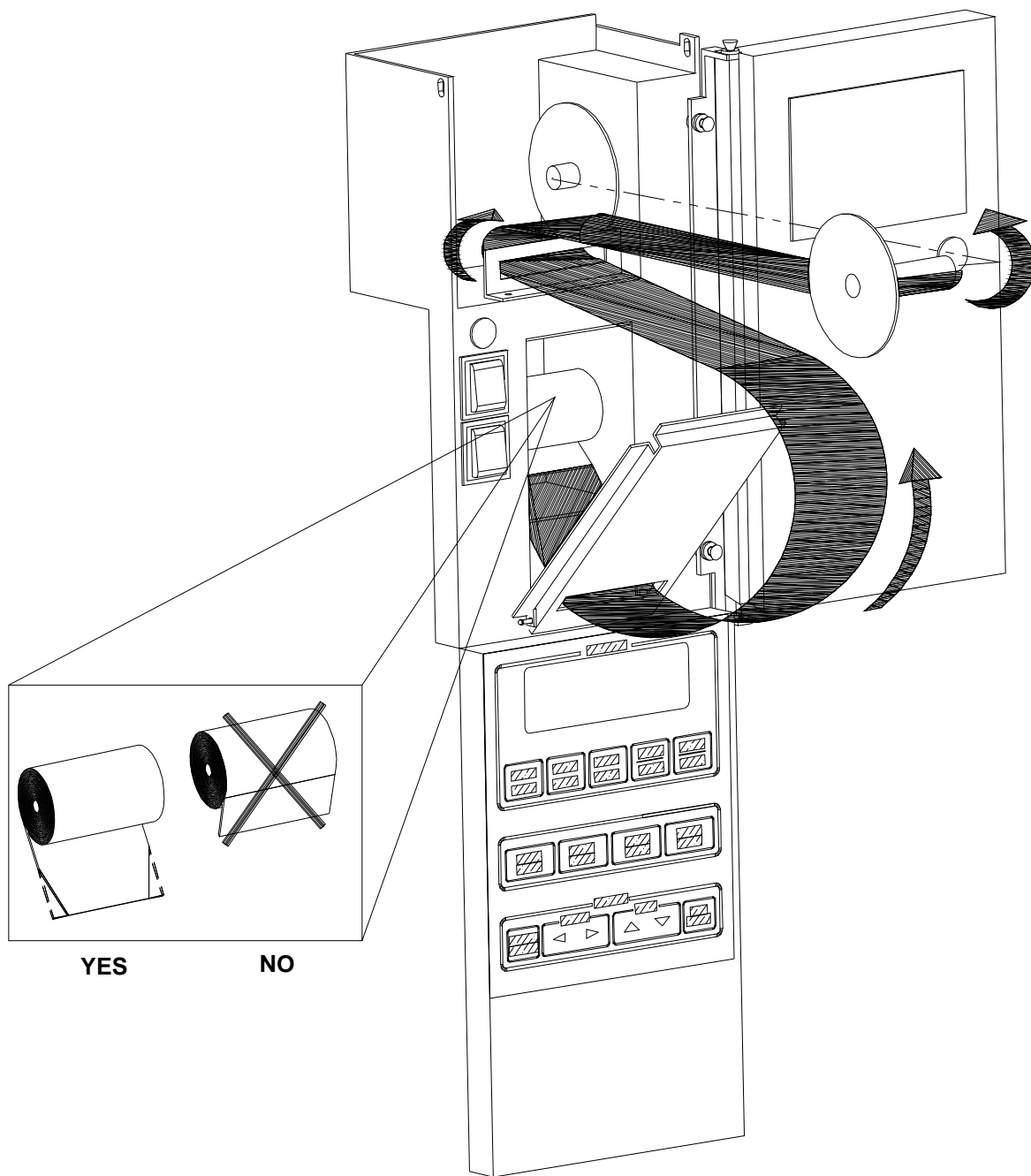
### 6.7.1 Printer Paper Roll Replacement

See Figure 6-7.

1. Set POWER-OFF/STANDBY switch to OFF/STANDBY. Lock disconnect switch in OFF position and close building supply valves.
2. Open printer door. Pull remaining paper (in an upward motion) through printer.
3. Remove take-up spindle from its drive mechanism by pulling to left.
4. Remove paper roll from take-up spindle and set empty take-up spindle aside.
5. Lower platen and remove lower paper spindle by pulling it straight forward.
6. Place new paper roll onto lower spindle with paper feeding downward from back of paper roll.

*NOTE: Verify paper roll is positioned correctly. Thermal paper does not print if paper is inserted backward. Do not use other brands of thermal paper, use only STERIS thermal paper (P129359-008). Damage to mechanisms can occur if paper of different width or thickness is used.*

7. Replace lower spindle (with new paper roll) back into position by pressing from front until it snaps into place.
8. Pull 4 or 5" (10 to 13 cm) of paper out from spool and tear corners to make a point.
9. Slide tab of paper roll into printer from back (with platen still in down position) until it exits from front of printer.
10. Grab tab of paper, pull out 10 to 12" (25 to 30 cm) of paper, and feed this paper through opening in platen.
11. Insert tab of new paper roll into slot of take-up spindle and rotate spindle in direction shown to secure paper in slot.
12. Raise platen back up into position and snap in place under catch.
13. Press take-up spindle back onto drive mechanism and allow motor to rotate spindle to verify paper is secured to take-up roll.
14. Set POWER/OFF-STANDBY switch to OFF-STANDBY position then to POWER to verify paper is correctly routed into mechanism and printer prints. Printer does not print if thermal paper was placed on wrong side.
15. Close printer door.



**Figure 6-7. Printer Paper Roll Replacement**

### **6.7.2 Storing Thermal Paper**


Thermal paper is subject to fading with time, humidity, and exposure to light.


It is manufacturer's recommendation that thermal paper be stored in a dark place with an average ambient temperature of less than 77°F (25°C) and a relative humidity less than 65%. Under these conditions, paper remains readable for at least five years. It is recommended that if printed data is to be retained for periods of time longer than five years (6 -25 years), an additional photocopy should be made for record retention. In any case, a duplicate set of records should be maintained in files of engineering or maintenance departments.


Thermal paper begins to develop color at about 158°F (70°C); however, under humid conditions it might begin to develop at an accelerated rate. If stored for 24 hours at 140°F (60°C), paper shows some signs of development. It also shows signs of development if stored for 24 hours at 113°F (45°C) and a relative humidity of 90%.

Do not store thermal paper next to other chemically treated papers - such as pressure sensitive paper or other type of recording round charts - as this may cause fading in print. If thermal paper is to be stored in same area, always ensure it and other chemically treated papers are kept in separate envelopes.

Thermal paper discolors when exposed to direct sunlight.

 **WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:** Only STERIS or STERIS-trained service personnel should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding Service options.

 **WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:** Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

 **WARNING – BURN HAZARD:** Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

This section contains detailed information on types of washer malfunctions likely to occur, and possible causes and corrective actions.

If you are unable to correct problem with use of the following Troubleshooting Charts, or if a problem occurs that is not described on chart, please call STERIS. A factory-trained technician will promptly place your washer in proper working condition.

*NOTE: Never permit unqualified persons to service washer.*

## Table Descriptions

**Table 7-1** – Problems where NO alarm or printout occur.

**Table 7-2** – Problems where alarm and/or printout occur.

**Table 7-1. No Alarm and/or Printout**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE AND/OR CORRECTION</b>
1. No power, screen is blank.	<ol style="list-style-type: none"><li>1. Building electrical supply disconnect switch (circuit breaker) OFF – position switch to ON.</li><li>2. Fuse in power supply failed – replace fuse.</li><li>3. Power supply failed – replace power supply.</li><li>4. Control board failed – replace control board.</li></ol>
2. Unable to select cycle.	<ol style="list-style-type: none"><li>1. Washer in Standby mode – set power switch to POWER.</li><li>2. Printer still printing – wait until printout completes.</li><li>3. Faulty touch pad – replace.</li><li>4. Safety cable pulled – open chamber door and check for obstruction. Press CYCLE/START touch pad to resume cycle operation.</li><li>5. Faulty door safety switch – replace safety switch.</li></ol>
3. Cycle does not start when CYCLE/START touch pad is pressed twice.	<ol style="list-style-type: none"><li>1. Chamber doors open – close and latch doors.</li><li>2. Hot water supply valve closed – open building and washer supply valves.</li><li>3. Faulty door safety switch – replace safety switch.</li><li>4. Faulty touch pad – replace.</li></ol>
4. Doors open once cycle is started.	<ol style="list-style-type: none"><li>1. Exhaust dampered too much – adjust automatic damper.</li><li>2. Door latch misadjusted – adjust latch.</li></ol>
5. Too much water entering chamber. Water overflowing from drip gutter.	<ol style="list-style-type: none"><li>1. Water level ball float malfunctions – verify operation of ball float. Clean or replace as necessary.</li><li>2. Fill solenoid valve remains open – repair or replace valve as necessary.</li></ol>
6. Detergent tank overfilling.	<ol style="list-style-type: none"><li>1. Water level ball float malfunctions – verify operation of ball float. Clean or replace as necessary.</li><li>2. Fill solenoid valve remains open – repair or replace valve as necessary.</li><li>3. Drain line plugged – flush out line.</li><li>4. Return valve misaligned – check operation of valve. Repair or replace as necessary.</li></ol>

**Table 7-1. No Alarm and/or Printout (Cont'd)**

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
7. Water leaks from washer.	<ol style="list-style-type: none"> <li>1. Chamber door(s) not fully closed – close and latch door(s).</li> <li>2. Door gasket worn or defective – replace gasket.</li> <li>3. Window gasket worn or defective – replace gasket.</li> <li>4. Spray jets misaligned – realign jets away from doors.</li> <li>5. Water level float ball malfunctions – verify operation of ball float. Clean or replace as necessary.</li> <li>6. Too much water entering chamber – refer to Problem #5.</li> <li>7. Piping leaks – check hose clamps, valves, and piping. Tighten connections as necessary.</li> <li>8. Exhaust dampered too much – adjust automatic damper.</li> <li>9. Building vent connections inadequate – increase CFM capabilities.</li> </ol>
8. Vapor escaping under door(s).	<ol style="list-style-type: none"> <li>1. Exhaust dampered too much – adjust automatic damper.</li> <li>2. Optional exhaust system off – verify operation of applicable option.</li> <li>3. Optional exhaust fan rotating in wrong direction – reverse fan rotation.</li> <li>4. Building vent connections inadequate – increase CFM capabilities.</li> </ol>
9. Pump starts before appropriate sump water level is reached.	<p>Water level ball float malfunctions – verify operation of ball float. Clean or replace as necessary.</p>
10. Pump runs with insufficient or no pump pressure.	<ol style="list-style-type: none"> <li>1. Pump suction strainer clogged – clean strainer.</li> <li>2. Water level ball float malfunctions – verify operation of float ball. Clean or replace as necessary.</li> <li>3. Water temperature in excess of 195°F (91°C) – lower temperature setpoint.</li> <li>4. Self-cleaning screen clogged – remove debris from screen.</li> <li>5. Loose hose connection on pump suction strainer – tighten hose clamps or replace as necessary.</li> <li>6. Pump rotating in wrong direction – verify pump rotation as indicated by arrow.</li> <li>7. Foam in chamber – rinse chamber with cold water and decrease detergent injection rate.</li> <li>8. Compression fitting on pump RTD, located in suction pick-up pipe, is leaking air – inspect for leaks and improper installation. Seal leaks or correct installation as necessary.</li> </ol>

**Table 7-1. No Alarm and/or Printout (Cont'd)**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE AND/OR CORRECTION</b>
11. Carriage drive system not operating properly.	<ol style="list-style-type: none"> <li>1. Drive clutch loose – tighten clutch to specifications.</li> <li>2. Spray headers hitting sealing strips covering the vertical panel joints – adjust headers as necessary.</li> <li>3. Drive cable loose or broken – tighten or replace cable as necessary.</li> </ol>
12. Washer operation stops during cycle.	<ol style="list-style-type: none"> <li>1. Loose connection in control wiring – inspect all control wiring connections and tighten if necessary.</li> <li>2. Electrical component failure (e.g. motor starter) – replace applicable component.</li> <li>3. Control fuse failed – replace fuse.</li> </ol>
13. Foam in chamber.	<ol style="list-style-type: none"> <li>1. Detergent is foaming – use recommended products.</li> <li>2. Too much detergent injected during Wash phase – verify injection rate.</li> </ol>
14. Chamber does not drain properly.	<ol style="list-style-type: none"> <li>1. Self-cleaning screen clogged – remove debris from screen.</li> <li>2. Drain line plugged – flush out line.</li> <li>3. Defective drain valve – repair or replace valve as necessary.</li> <li>4. Drain time set too short – lengthen programmed drain time to approximately 15 seconds past pressure drop.</li> </ol>
15. Load comes out dirty.	<ol style="list-style-type: none"> <li>1. Empty detergent container – replace container.</li> <li>2. Incorrect detergent used – use recommended products.</li> <li>3. Spray jets clogged – clean jets.</li> <li>4. Pump suction strainer clogged – clean strainer.</li> <li>5. Water temperature in excess of 195°F (91°C) – lower temperature setpoint.</li> <li>6. Self-cleaning screen clogged – remove debris from screen.</li> <li>7. Loose hose connection on pump suction strainer – tighten hose clamps or replace as necessary.</li> <li>8. Spray jets misaligned – realign jets toward load surfaces.</li> <li>9. Pump rotating in wrong direction – verify pump rotation as indicated by arrow.</li> </ol>
16. Printing defect appears consistently in the same column.	Debris trapped on print head – dislodge debris by removing thermal paper from printer, inserting a 1" [25 mm] wide strip of bond type paper under print head, and moving paper in both linear and circular motions.

**Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE AND/OR CORRECTION</b>
<p>1. Display shows:  <b>STOP BUTTON PRESSED!</b>  <b>PUSH START TO RESUME</b>  ... and printer prints:  ALARM: HH:SS:MM  STOP BUTTON PRESSED!</p>	<p>STOP/RESET touch pad pressed – press <b>CYCLE/START</b> touch pad to resume cycle operation, or press <b>STOP/RESET</b> touch pad again to abort cycle operation.</p>
<p>2. Display shows:  <b>LOAD DOOR</b>  <b>OPEN WHEN PROCESSING</b>  ... and printer prints:  ALARM HH:MM:SS  LOAD DOOR  OPEN WHILE PROCESSING</p>	<p>1. Load-side door open – close and latch door. Press <b>CYCLE/START</b> touch pad to resume cycle operation.  2. If condition reoccurs, call Service.*</p>
<p>3. Display shows:  <b>UNLOAD DOOR</b>  <b>OPEN WHEN PROCESSING</b>  ... and printer prints:  ALARM HH:MM:SS  UNLOAD DOOR  OPEN WHILE PROCESSING</p>	<p>1. Unload-side door open – close and latch door. Press <b>CYCLE/START</b> touch pad to resume cycle operation.  2. If condition reoccurs, call Service.*</p>
<p>4. Display shows:  <b>SUMP</b>  <b>TOO LONG IN FILL</b>  ... and printer prints:  ALARM HH:MM:SS  SUMP  TOO LONG IN FILL</p>	<p>1. Supply valves not fully open – open building and washer supply valves.  2. Foam in chamber – rinse chamber with cold water and decrease detergent injection rate.  3. If situation reoccurs, call Service.*</p>
<p>5. Display shows:  <b>SUMP</b>  <b>TOO LONG IN DRAIN</b>  ... and printer prints:  ALARM HH:MM:SS  SUMP  TOO LONG IN DRAIN</p>	<p>1. Self-cleaning screen clogged – remove debris from screen.  2. If situation reoccurs, call Service.*</p>

*\* Service Charges may be incurred. Consult your warranty for details.*

**Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE AND/OR CORRECTION</b>
<p>6. Display shows:  <b>SUMP RTD FAILURE</b>  ... and printer prints:  ALARM                      HH:MM:SS  SUMP  RTD FAILURE</p>	<ol style="list-style-type: none"> <li>1. Faulty RTD sensor in chamber sump – clean as necessary.</li> <li>2. If situation reoccurs, call Service.*</li> </ol>
<p>7. Display shows:  <b>SUMP  FAILED TO REACH TEMP</b>  ... and printer prints:  ALARM                      HH:MM:SS  SUMP  FAILED TO REACH TEMP</p>	<ol style="list-style-type: none"> <li>1. Steam supply valve not fully open – open building and washer supply valves.</li> <li>2. Temperature set too high – decrease programmed temperature setpoint.</li> <li>3. Poor electrical connection between sump RTD sensor and control – inspect connections and tighten if necessary.</li> <li>4. Damper opened too wide – partially close damper.</li> <li>5. Low dynamic steam pressure – provide steam at pressure specified on equipment drawing.</li> <li>6. Faulty RTD sensor in chamber sump – clean as necessary.</li> <li>7. If situation reoccurs, call Service.*</li> </ol>
<p>8. Display shows:  <b>ALK. TANK  TOO LONG IN FILL</b>  ... and printer prints:  ALARM                      HH:MM:SS  ALK. TANK  TOO LONG IN FILL</p>	<ol style="list-style-type: none"> <li>1. Hot water supply valve closed – open building and washer supply valves.</li> <li>2. Manual drain valve open – close valve.</li> <li>3. Water level float ball malfunctions – verify operation of ball float. Clean as necessary.</li> <li>4. Building water supply pressure too low – increase supply pressure.</li> <li>5. If situation reoccurs, call Service.*</li> </ol>
<p>9. Display shows:  <b>ALK. TANK  RTD FAILURE</b>  and printer prints:  ALARM                      HH:MM:SS  ALK. TANK RTD FAILURE</p>	<ol style="list-style-type: none"> <li>1. Faulty RTD sensor in detergent tank – clean as necessary.</li> <li>2. If situation reoccurs, call Service.*</li> </ol>

*\* Service Charges may be incurred. Consult your warranty for details.*

**Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)**

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
<p>10. Display shows:  <b>ALK. TANK          FAILED TO REACH TEMP</b>          ... and printer prints:          ALARM            HH:MM:SS          ALK TANK          FAIL TO REACH TEMP</p>	<ol style="list-style-type: none"> <li>1. Steam supply valve not fully open – open building and washer supply valves.</li> <li>2. Temperature set too high – decrease programmed temperature setpoint.</li> <li>3. Poor electrical connection between detergent tank RTD sensor and control – inspect connections and tighten if necessary.</li> <li>4. Low dynamic steam pressure – provide steam at pressure specified on equipment drawing.</li> <li>5. Fill water temperature too low – increase temperature of building water supply.</li> <li>6. Faulty RTD sensor in detergent tank – clean as necessary.</li> <li>7. If situation reoccurs, call Service.*</li> </ol>
<p>11. Display shows:  <b>ACID TANK          TOO LONG IN FILL</b>          ... and printer prints:          ALARM            HH:MM:SS          ACID TANK          TOO LONG IN FILL</p>	<ol style="list-style-type: none"> <li>1. Hot water supply valve closed – open building and washer supply valves.</li> <li>2. Manual drain valve open – close valve.</li> <li>3. Water level float ball malfunctions – verify operation of ball float. Clean as necessary.</li> <li>4. Building water supply pressure too low – increase supply pressure.</li> <li>5. If situation reoccurs, call Service.*</li> </ol>
<p>12. Display shows:  <b>ACID TANK          RTD FAILURE</b>          ... and printer prints:          ALARM            HH:MM:SS          ACID TANK          RTD FAILURE</p>	<ol style="list-style-type: none"> <li>1. Faulty RTD sensor in detergent tank – clean as necessary.</li> <li>2. If situation reoccurs, call Service.*</li> </ol>
<p>13. Display shows:  <b>ACID TANK          FAILED TO REACH TEMP</b>          ... and printer prints:          ALARM            HH:MM:SS          ACID TANK          FAIL TO REACH TEMP</p>	<ol style="list-style-type: none"> <li>1. Steam supply valve not fully open – open building and washer supply valves.</li> <li>2. Temperature set too high – decrease programmed temperature setpoint.</li> <li>3. Poor electrical connection between detergent tank RTD sensor and control – inspect connections and tighten if necessary.</li> <li>4. Low dynamic steam pressure – provide steam at pressure specified on equipment drawing.</li> <li>5. Fill water temperature too low – increase temperature of building water supply.</li> <li>6. Faulty RTD sensor in detergent tank – clean as necessary.</li> <li>7. If situation reoccurs, call Service.*</li> </ol>

*\* Service Charges may be incurred. Consult your warranty for details.*

**Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE AND/OR CORRECTION</b>
<p>14. Display shows:  <b>EMERGENCY STOP  CABLE ACTIVATED</b>  ... and printer prints:  ALARM            HH:MM:SS  EMERGENCY STOP</p>	<ol style="list-style-type: none"> <li>1. Safety cable pulled – open chamber door and remove obstruction from chamber. Press <b>CYCLE/START</b> touch pad to resume cycle operation.</li> <li>2. Safety cable too tight – adjust cable to allow a minimum of two inches (50 mm) free play.</li> </ol>
<p>15. Display shows:  <b>COOLDOWN TANK  TOO LONG IN FILL</b>  ... and printer prints:  ALARM            HH:MM:SS  COOLDOWN TANK  TOO LONG IN FILL</p>	<p>Call Service.*</p>
<p>16. Display shows:  <b>COOLDOWN TANK  TOO LONG TO COOL</b>  ... and printer prints:  ALARM            HH:MM:SS  COOLDOWN TANK  TOO LONG TO COOL</p>	<ol style="list-style-type: none"> <li>1. Cold water supply valve not fully open – open building and washer supply valves.</li> <li>2. If situation reoccurs, call Service.*</li> </ol>
<p>17. Display shows:  <b>COOLDOWN TANK  TOO LONG IN DRAIN</b>  ... and printer prints:  ALARM            HH:MM:SS  COOLDOWN TANK  TOO LONG IN DRAIN</p>	<p>Call Service.*</p>
<p>18. Display shows:  <b>COOLDOWN TANK  IS FULL</b>  ... and printer prints:  ALARM            HH:MM:SS  COOLDOWN TANK  IS FULL</p>	<ol style="list-style-type: none"> <li>1. Cooldown tank high water level ball float malfunction – verify operation of float. Clean as necessary.</li> <li>2. If situation reoccurs, call Service.*</li> </ol>

*\* Service Charges may be incurred. Consult your warranty for details.*

**Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE AND/OR CORRECTION</b>
19. Display shows: <b>COOLDOWN TANK FLOAT FAILURE</b> ... and printer prints: ALARM            HH:MM:SS COOLDOWN TANK FLOAT FAILURE	1. Cooldown tank high or low water level ball float malfunction – verify operation of float. Clean as necessary. 2. If situation reoccurs, call Service.*
20. Display shows: <b>COOLDOWN TANK RTD FAILURE</b> ... and printer prints: ALARM            HH:MM:SS COOLDOWN TANK RTD FAILURE	Call Service.*
21. Display shows: <b>pH TOO HIGH CHECK INJ. SYSTEM</b> ... and printer prints: ALARM            HH:MM:SS pH TOO HIGH CHECK INJ. SYSTEM	1. Alkaline neutralizer container empty – verify and replace container. 2. Wrong chemical used – verify and replace as necessary. 3. Self-cleaning screen clogged – remove debris from screen (if pH is done in sump). 4. If situation reoccurs, call Service.*
22. Display shows: <b>pH TOO LOW CHECK INJ. SYSTEM</b> ... and printer prints: ALARM            HH:MM:SS pH TOO LOW CHECK INJ. SYSTEM	1. Acid neutralizer container empty – verify and replace container. 2. Wrong chemical used – verify and replace as necessary. 3. Self-cleaning screen clogged – clean strainer (if pH is done in sump). 4. If situation reoccurs, call Service.*
23. Display shows: <b>FALSE pH READING</b> ... and printer prints: ALARM            HH:MM:SS FALSE pH READING	Call Service.*

*\* Service Charges may be incurred. Consult your warranty for details.*

**Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE AND/OR CORRECTION</b>
24. Display shows: <b>pH CONTROLLER NOT RESPONDING</b> ... and printer prints: ALARM      HH:MM:SS pH CONTROLLER NOT RESPONDING	Call Service.*
25. Display shows: <b>CONC. TOO LOW CHECK INJ. SYSTEM</b> ... and printer prints: ALARM      HH:MM:SS CONC. TOO LOW CHECK INJ. SYSTEM	1. No alkaline detergent in container – verify and replace container. 2. No acid detergent in container – verify and replace container. 3. If situation reoccurs, call Service.*
26. Display shows: <b>ALK WASH DETERGENT EMPTY</b> ... and printer prints: ALARM      HH:MM:SS ALK WASH DETERGENT EMPTY	1. No alkaline detergent in container – verify and replace detergent. 2. If situation reoccurs, call Service.*
27. Display shows: <b>ACIDWASH DETERGENT EMPTY</b> ... and printer prints: ALARM      HH:MM:SS ACIDWASH DETERGENT EMPTY	1. No acid detergent in container – verify and replace detergent. 2. If situation reoccurs, call Service.*
28. Display shows: <b>CARRIAGE SYSTEM FAILURE</b> ... and printer prints: ALARM      HH:MM:SS CARRIAGE SYSTEM FAILURE	Call Service.*

*\* Service Charges may be incurred. Consult your warranty for details.*

**Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)**

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
<p>29. Display shows:</p> <p><b>UNKNOWN</b></p> <p><b>FAILURE DETECTED</b></p> <p>... and printer prints:</p> <p>ALARM            HH:MM:SS</p> <p>UNKNOWN</p> <p>FAILURE DETECTED</p>	<p>Call Service.*</p>

*\* Service Charges may be incurred. Consult your warranty for details.*